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ABSTRACT

This study is based on a detailed analysis of the financial and operational characteristics of 50 pre-doctoral colleges over the period of Fall 1967 to Spring 1970. Where there are financial difficulties, they are largely a result of internal decisions, both within the colleges themselves and in higher education as a whole as when objectives that cannot reasonably be fulfilled are established. The data for the study was collected during personal visits to each of the campuses over a period from July 1970 to March 1971. The interviews are part of the data and shape the interpretation of much of the hard data. This study is divided into two parts. Part I discusses, mainly, the collection of data. An overall financial analysis is made, and the impact of federal aid on the financial status of colleges is studied. The benefits of efficient management and various college policies are also discussed. A bibliography is included. Part II is divided into four sections. Section I presents a number of statistical tables which summarize the major items of data collected and developed for the study. Section II provides statistical documentation of the major financial, instructional and federal aid characteristics used in the analysis of finance in Part I. Sections III and IV describe the stepwise regression and the analysis of variance used to examine the patterns of resource allocation at the 50 colleges studied. (Author/CK)

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THE COST OF COLLEGE

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Points of view or opinions expressed do not necessarily represent official Office of Education position or policy.

Final Report - Phase I

COLUMBIA RESEARCH ASSOCIATES
Cambridge, Mass.

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PART I

THE COST OF COLLEGE

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INTRODUCTION

Everyone knows that higher education in the United States is facing a "crisis". Few seem to understand the nature of the crisis beyond the fact that it is basically financial in nature, a supposition that is not particularly helpful, since the crises which fail to diminish in the face of (preferably massive) funding increases are rare indeed. Thus, for example, we are shown that faculty salaries have risen and are rising by some eight to ten percent per year but not why these increases are outrunning wage levels in general and the cost of living in particular. Costs per student escalate at an even higher rate, but why this should be so, is vague. And expenditures seem mysteriously to climb at a slightly faster rate than revenues: The Cost of College attempts to explore some of these questions.

The study is based on a detailed analysis of the financial and operational characteristics of fifty pre-doctoral colleges over the period of Fall 1967 to Spring 1970 (FY 1968-70). In large measure, the results of this study show that the crisis is manifested in various ways: for some, "financial difficulties" imply that new programs must be postponed, for others, a close look at marginal programs is being undertaken with an eye to cutting them,--and for some, the financial squeeze will force them to close their doors within the next few years. Some of our sample of fifty colleges are financially healthy if not actually robust--and some of these, surprisingly, are almost solely dependent on students' tuitions and fees.

All in all, it is our conclusion that where there are financial difficulties, they are largely a result of internal decisions both within the colleges themselves--as when objectives are established which exceed reasonable expectations of fulfillment--and in higher education as a whole--as when all colleges collectively strive to attain nationally inconsistent objectives. It is obviously impossible, for example, for every school simultaneously to raise the entrance standards for its incoming freshmen class, but it is equally improbable that an individual institution can do so if it draws from a relatively fixed base of graduating seniors.

Indeed, these considerations leave us to a formulation of analysis in which the "constitutency" which a college serves plays a crucial role in determining what kind of school it will be and therefore, what its costs will be. In responding to their "constituencies" colleges tend to pattern themselves along lines which we classify "academic" "utilitarian", and "general".

Using these typologies as an analytical framework we noted the following:

--a tendency to accept costly programs involving independent study and small group seminars without first assessing their appropriateness to the role of the school or its constituency which can lead to financial difficulty by forcing rising costs,
--rapidly expanding budgets of state-supported institutions which have tended to create serious competitive problems for the private schools dependent on rapidly rising tuitions (we feel, however, that the period of rapid public school growth may be drawing to a close),
--that expenditures may be overtaking revenues is not supported by our statistics (from Fall 1967 through Spring 1970 expenditures rose 25.9 percent and revenues 25.7 percent, a negligible difference)
--that the financial squeeze is very real for some schools, and selective programs of Federal institutional aid are appropriate.

The data for the study was collected during personal visits to each of the campuses over a period from July 1970 to March 1971. Our interviews are part of the data and shaped our interpretation of much of the "hard" data.

The reader may often find himself exasperated by observations and conclusions based more on subjective criteria than on the statistics. All we can do then, unfortunately, is point to the collective impressions gained in conversations with individuals at these and other colleges. We would, of course, be distressed if our impressions and the statistics were seriously at odds; they were not.

Finally, we wish to extend our thanks to the many college presidents and administrators who were so hospitable to us in the course of our visits. We talked with literally hundreds of individuals who are concerned not only with their own institutions' well being but with that of all of higher education. Their opinions are valuable to us and to this study; we hope we have done justice to them and accept responsibility where we have not.

Cambridge, Massachusetts

I. THE STUDY

We assume, in The Cost of College, that the nation's objective, and the the appropriate federal government concern, is to provide each youth with an opportunity to acquire that type of post-high-school education which is appropriate to his interests and capabilities. We assume, furthermore, that this opportunity should be made available without regard to students' ability to pay. The issue is whether and what kind of federal programs are helping or could help us transform the assumptions into realities. In the end the issue is simply what are the costs of college, how are they to be met, and how have the present federal student aid programs helped?

The Cost of College was designed with objectives which are admittedly limited but, if attained, can assist us to respond more knowledgeably to those issues. The approach was simply to examine higher education at the institutional level in order to test the impacts of alternative hypothetical programs as well as existing programs on the schools themselves.

In any program there is always the possibility that the institution might respond in such a way as to cause unanticipated indirect effects. There can, in fact, be not only second-order but multi-order, subtle effects which may not be apparent if the materials are too severely limited to a single aspect of institutional operation. The Cost of College is thus based on a very substantial amount of data which goes well beyond the obvious questions concerning budgets, finances, and enrollments.

A. The Colleges

The extraordinary diversity of characteristics in U.S. institutions of higher education presents comparably complex problems in analysis. It obviously makes little sense to compare a large state university with a junior college unless one has a relatively large sample of each class of institution. The Coming Depression in Higher Education [3], for example, with a sample of only forty-one colleges and universities, had to draw conclusions for six different categories of institutions* and then, somewhat precariously in our view, assume the applicability of those conclusions to all of higher education.

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*These were: national research universities, leading regional research universities, state and comprehensive colleges, liberal arts colleges, black colleges, and two-year colleges.

Since The Cost of College was limited to a sample size of fifty institutions, we chose to limit the study to a more restricted population, viz., the 4- and 5-year predoctoral colleges. This limitation of the population has additional advantages. The primary mission of each of the colleges in our study is teaching; none of them would consider itself as heavily oriented toward research. We can, therefore, focus on the cost and manner in which this single mission is fulfilled apart from the impacts of other 'outputs' of higher education which often tend to obscure results. For another thing, the principal Federal student aid programs* are aimed at the undergraduate population and so will be more important to these schools.

Of the 2,551 institutions of higher education in the United States in the summer of 1969 there were 754 four- and five-year baccalaureate-degree-granting and 625 masters-degree granting colleges [13, p. 16]. Forty-nine or 3.6% of these 1352 are represented in our sample. One of our sample is a small doctorate-granting institution which shares many of the characteristics of the 4- and 5-year schools and was chosen to provide one point for which a comparison of effects of doctoral programs could be obtained.

The fifty colleges selected (Table 1) include**

20 publicly-(i.e., state-) controlled schools--
  5 enrolling 500-2,000 students,
  6 enrolling 2,000-4,000 students,
  9 enrolling over 4,000 students

16 independent (private, non-sectarian) schools--
  9 enrolling 500-2,000 students,
  7 enrolling over 2,500 students, and

14 religious (private) schools--
  8 enrolling 500-2,000 students,
  6 enrolling over 2,000 students.

Schools were selected by repeated random sampling from the USOE directory of education until each of these preselected type-of-control and enrollment strata were filled. It will turn out, as we will see, that categories related to type of control and size are less revealing then others which we will examine. Thirty-two states and the District of Columbia are represented in the following regional breakdowns:

New England	5
Middle Atlantic	10
Great Lakes	9
Middle West	6
Southeast (including Texas)	10
Southwest and Mountain States	5
Pacific Coast	5
	50

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* Viz., the Educational Opportunity Grant (EOG), National Defense Student Loan (NDSL), and the College Work/Study (CWS) programs.

** Enrollment and control as reported in Fall 1969. Hereafter we use the terms "public", "independent", and "religious" to designate the three types of control.

NAME OF SCHOOL	STATE	REGION	CONTROL
Bard College	New York	Mid East	Independent
Bennington College	Vermont	New England	Independent
Berea College	Kentucky	Southeast	Independent
Calvin College	Michigan	Great Lakes	Religious
Capital University	Ohio	Great Lakes	Religious
Carleton College	Minnesota	Plains	Independent
Clark University	Massachusetts	New England	Independent
Cleveland State University	Ohio	Great Lakes	Public
Drake University	Iowa	Plains	Independent
Eastern Illinois University	Illinois	Great Lakes	Public
Ferris State College	Michigan	Great Lakes	Public
Fort Valley State College	Georgia	Southeast	Public
Furman University	S. Carolina	Southeast	Religious
Humboldt State College	California	Far West	Public
Indiana University at Fort Wayne	Indiana	Plains	Public
Langston University	Oklahoma	Southwest	Public
Loretto Heights College	Colorado	Rocky Mtn.	Independent
Loyola College	Maryland	Mid East	Religious
Madison College	Virginia	Southeast	Public
University of Maine at Farmington	Maine	New England	Public
Mississippi Valley State College	Mississippi	Southeast	Public
Missouri Southern College	Missouri	Plains	Public
Missouri Valley College	Missouri	Plains	Religious
Monmouth College	New Jersey	Mid East	Independent
Montclair State College	New Jersey	Mid East	Public
U.N.H. - Keene State College	New Hampshire	New England	Public
College of New Rochelle	New York	Mid East	Independent
Nicholls State College	Louisiana	Southeast	Public
North Adams State College	Massachusetts	New England	Public
U. of North Carolina - Asheville	North Carolina	Southeast	Public
Oberlin College	Ohio	Great Lakes	Independent
Oklahoma City University	Oklahoma	Southwest	Religious
Pomona College	California	Far West	Independent
Portland State College	Oregon	Far West	Public
Prairie View A & M	Texas	Southwest	Public
University of Puget Sound	Washington	Far West	Religious
Rollins College	Florida	Southeast	Independent
St. Mary of the Woods	Indiana	Plains	Religious
St. Mary's University	Texas	Southwest	Religious
College of Sante Fe	New Mexico	Southwest	Religious
University of Scranton	Pennsylvania	Mid East	Religious
College of Southern Utah	Utah	Rocky Mtn.	Public
University of the South	Tennessee	Southeast	Religious
Spring Hill College	Alabama	Southeast	Religious
SUNY - Brockport	New York	Mid East	Public
Trinity College	D.C.	Mid East	Religious
Tuskegee Institute	Alabama	Southeast	Independent
Washington College	Maryland	Mid East	Independent
Whittier College	California	Far West	Independent
Wilkes College	Pennsylvania	Mid East	Independent

Table 1. Characteristics of Sample Colleges

Figures 1 and 2 show the enrollment and geographical distribution of the selected colleges, respectively.

The twenty public colleges are drawn from among 273 such colleges, the sixteen independent from among426, and the fourteen religious from among 637. (The remaining sixteen 4- and 5-year colleges are under federal or local control). The larger relative proportion of public colleges was designed to reflect their larger enrollments. Those in our sample average 4,200 students compared with 2,300 in the independent schools and 2,000 in the religious colleges. The schools in our sample enrolled 150,000 students.

Selection of predoctoral colleges as the focus of this study produced some results which, although not unexpected, reflect characteristics specific to this institutional level. For example, the state colleges tend to be either former teacher colleges or to have offered strong curricula in education. As a result, their enrollments in education majors are relatively high as is the proportion of women enrolled. The South is well-represented, reflecting the relatively larger number of predoctoral institutions there. Four of the five predominately black colleges included are in the South.

Since the sample includes the extremes in academic standing, from the weakest of the developing state institutions to the most prestigious of the small private colleges, financial indicators ranging over this entire gamut can be examined.

What are the characteristics of the class of colleges represented in the sample of this study? Based on American College Testing Program (ACT) results, the academic potential of their newly-admitted enrollees is higher than that of 2-year college enrollees but substantially below that of those entering Ph.D.-granting institutions (ACT composite scores are, respectively, 19.5, 18.2, 22.1 [5, p.24]). In other respects, such as ultimate level of degree sought, students' personal goals, and factors considered in selecting a college, 4- and 5-year college enrollees appear to be similar to university enrollees [5, p. 12ff].

Despite the limited population from which the sample was selected and the stratification criteria which were established, results are not intended for use in any formal way for projection to the whole population. While we may generalize many of our results, we should prefer to do so only when they are so clearcut that a high degree of statistical confidence can be associated with their application to the entire population of 4-year colleges.

Results cannot be said to apply to either the community colleges or the universities. It should be obvious, of course, that in those areas of undergraduate education where there are strong similarities, judgements in favor of broader applicability of specific results might well be appropriate. For example, research, which plays an important role in universities, is widely supposed to generate external economies for undergraduate instruction by paying for part of instructors' salaries and by making graduate assistants available for undergraduate instruction. On the other hand, where there are similarities in function and organization, the analyst can make broader generalizations regarding those particular

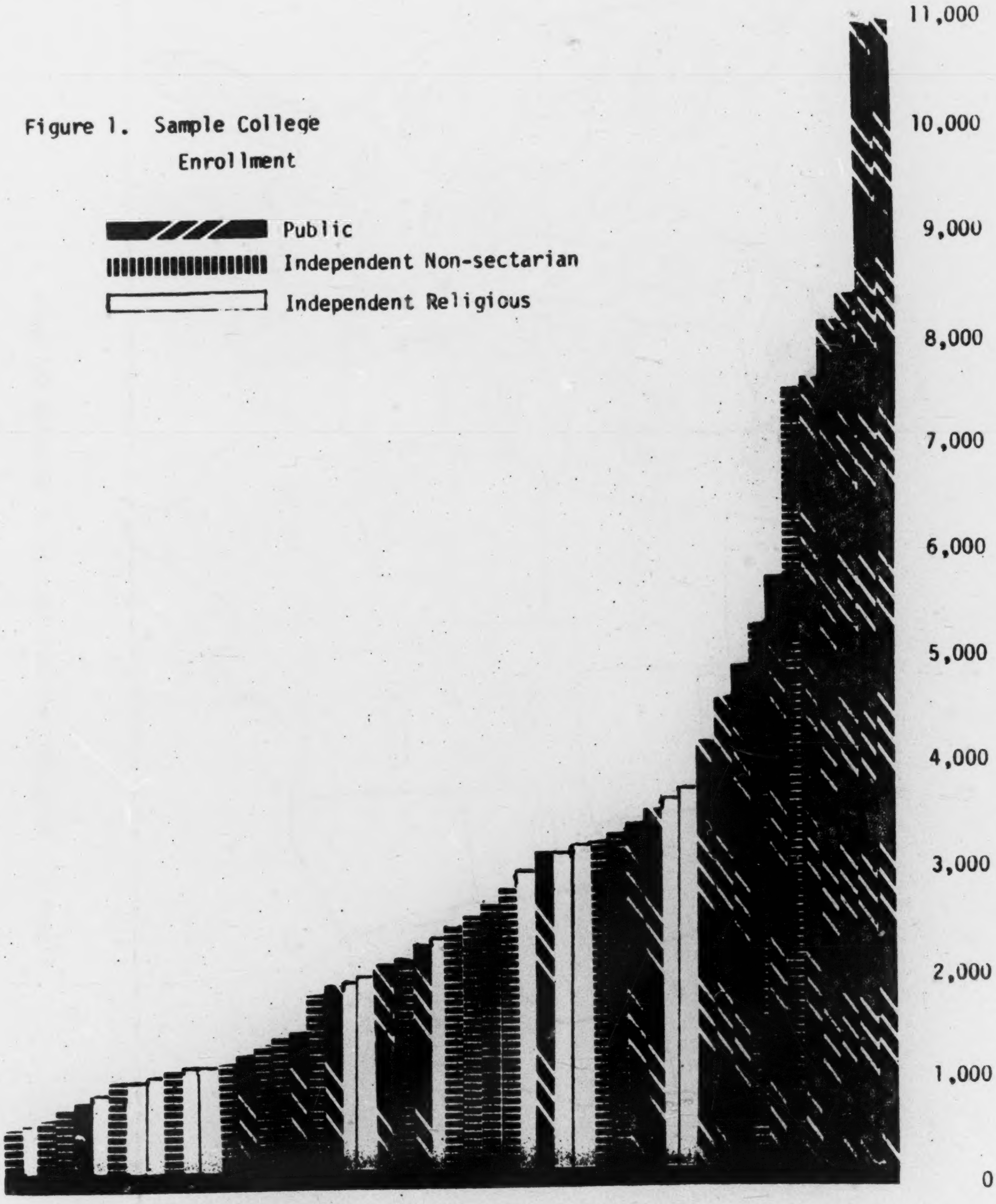

Figure 1. Sample College Enrollment

Source: [11]

Note: Enrollments published in this source differ significantly from the figures developed for this study.

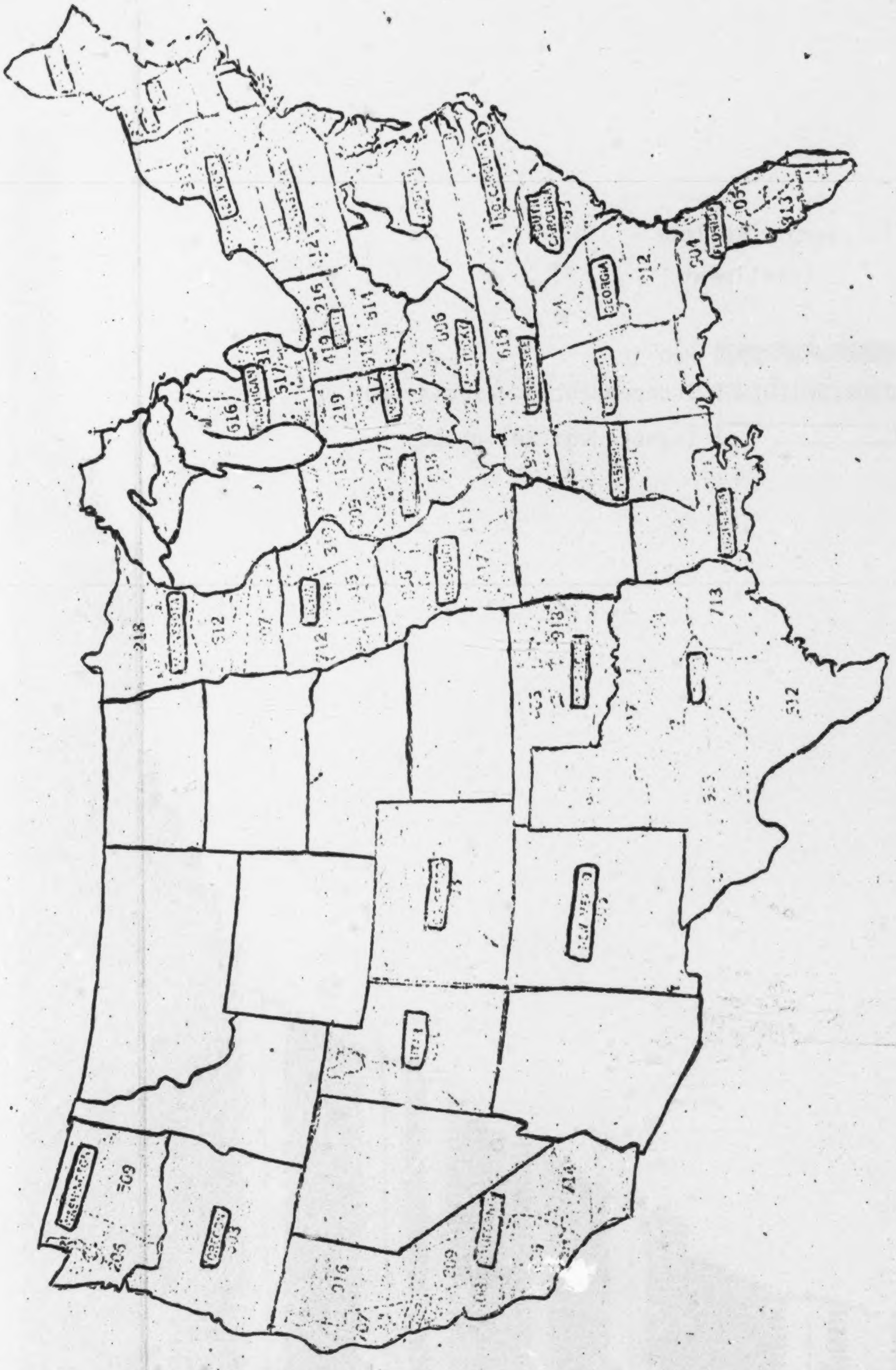
MICHIGAN
GEORGIA
SOUTH CAROLINA
FLORIDA
WASHINGTON
OREGON
CALIFORNIA

Figure 2. Geographical Distribution of Selected Colleges

features. For example, the number of undergraduate sections offered and their distribution by field and class size could hardly be expected to be any different in universities than in 4- and 5-year colleges.

B. The "Hard" Data

The specification of data items to be obtained was based on a rather simple line of analysis, viz.,

> --the central function of the sample colleges is the provision of "education" in the form of classroom instruction*; the analysis of college costs and resource allocation requires information on this function, at a section-by-section and course-by-course level of detail (approximately 100,000 items for each year),
> --classroom instruction is provided by teachers; they are by far the largest operational expense item in college budgets; data on them, their salaries, and their functions is another analytical requirement (approximately 4,000 per year), and
> --the colleges have resources, which they must allocate among classroom instruction and the various required supporting functions. They may also, because of their non-financial resources, make resource allocations for research and public service which are essentially discretionary. Data on revenues and expenditures at a detailed level is needed for this analysis (approximately 1,500 items per year).

In addition to these basic elements, much more is needed to describe a college so that a meaningful context for the quantitative data can be constructed. For this purpose, The Cost of College uses data specifically relating to:

> --application, acceptance, and academic achievement statistics for entering freshmen**

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*Recognizing, of course, that this is hardly the only way to provide education. Formal apprenticeship programs, especially on-the-job training, are a time honored way of providing many trades and professions with a large proportion of their preparation. Very advanced work (at say, the postdoctoral level) may involve research under the direction of a senior person. And many educators would emphasize the simple day-to-day interaction of students with and within a "learning environment". In these fifty colleges, however, provision of classroom instruction is overwhelmingly the most important educational function. Few of them would consider themselves as having a heavy stake in research and it is quite unlikely that any would exist for long if it ceased to offer classroom instruction as its principal form of education.

**As measured by Scholastic Aptitude Test (SAT) scores and high school class standings. Where American College Testing (ACT) scores are used by the college they were converted to SAT equivalents [2 , p. 105]. We are aware of the recent criticisms of SAT and other testing devises which note the problems associated with constructing "culture free" tests. None of the schools in our sample offers "culture free" education, however, and SAT tests probably are quite meaningful in relating their "client" needs to their programs. See Chapter 2.

- --enrollments (by level and major, where available)
- --facilities
- --program requirements, as laid out by the colleges, and
- --detail on student aid programs with particular emphasis on the federal EOG, NDSL, and College Work/Study programs.

The cost of classroom teaching lies at the heart of any analysis of college costs. The first step in this analysis involved matching instructors with classes as a means of computing the classroom hours per instructor and of identifying deviations from norms for further analysis. Generally, the colleges were able to explain deviations so that a firm figure for the actual cost of classroom instruction could be developed.

Analysis of expenditures and revenues was somewhat more complex. It is easy for the analyst to overlook the fact that the form of budget/expenditure classification may generate spurious indicators of basic relationships. If a school, for whatever reason, tends to maintain accountability in a form different than other schools, then its "differentness" may well be significantly related to one or more of its other characteristics. In fact, however, when comparable assignments of expenditures are made the school may be shown not to be statistically different than the others.

The difficulty is, of course, in assuming consistency of assignments among all the colleges, a problem not unique to this study [9 , p.vii]. Most analysts of higher education are now familiar with the bewildering array of accounting formats which colleges use. To cut through this jungle of definitions, restricted and unrestricted fund accounting, and frequently anachronistic state accounting requirements, we simply accepted and coded each item at the most detailed level feasible. This detail, in all cases, was sufficient to permit us to classify according to our own analytical schema so that data would be consistent over all colleges.

Other data proved more tractable for analysis and substantially less voluminous.

It is important to note that results here are based on analysis of colleges' own records. The data are those which any college necessarily maintains for its own functioning. While the analytical interpretations of specific items of data might vary, or definitions questioned, the information is about as close to "truth" as one can feasibly get.

C. Campus Interviews

There are two more problems. First, data of the type needed does not simply gush forth at the mailing of a questionnaire. Second, all the "hard" data there is still does not quite tell one with what "kind" of college he is dealing.

Questionnaire-type responses, although an efficient way of gathering data, fall short if the appropriate questions are not asked. Then the college which is unique in some respect (and virtually all are) which would affect the analytical results might only be seen as a statistical aberration in the final results. Only by conducting on-site interviews with a number of administrators is one able to obtain an adequate sense of those special qualities about which further questions require answers. The simplistic "cost per student", for example, will be meaningless unless we understand the individual colleges' varying objectives and purposes. The role which a college chooses for itself can impact crucially upon costs.

Therefore, the "hard" data were supplemented with the more subjective evaluations gleaned from talking and working with college administrators. We wanted to know the colleges' goals and objectives, what kinds of students theirs were, and from what kinds of families they come. It was helpful, too, to learn something of the pressures under which decisions are made, how budgets are allocated, and, in short, where the colleges were headed. The types of data are dealt heavily with institutions' self perceptions, the degree to which objectives and goals could be articulated, characteristics of their client populations, and adequacy of their records.

The results of evaluating these softer data are impressionistic and probably subjective. (It happens, however, that the hard data, once analyzed, almost always supported the impressions gained at the time of the visits.)

II. THE COLLEGE CONSTITUENCY

The per student cost of college can vary markedly--even wildly--among institutions. We don't know why. Many, possibly the majority, of studies dealing with college costs seldom go further than a simple presentation of financial characteristics and descriptions of averages and trends [GA, RB, B]. One recent analysis shows how the management of class sizes and loads can affect costs [Bower], thus recognizing, as few of the other studies do, that certain variables in the cost formula are subject to control. It is not difficult to catalog reasons why costs vary:--variations in faculty salaries, teaching loads, class sizes, and non-educational expenditures (student aid, for example) account for most of them. Unfortunately such circularity of cause and effect offers the policy-maker little guidance in designing programs responsive to the problems of college finance.

In this chapter we suggest that the costs of college education are determined by certain fundamental variables relating to colleges' own perception of their role in the community, the needs and desires of its particular group of students, and the needs of its "constituency", i.e., the entire set of groups which it must somehow serve.

Retracing the argument, let us see just how great variations in costs can be. For the colleges in this study costs ranged from a high of $6148 per full-time student down to $929 in 1969-70. Instruction costs, which presumably should tend toward equality because of the homogeneity of cost elements included, ranged from $1536 down to $391.

These ranges, if not the precise figures, are supported by other studies. The Golden Years shows total per student costs ranging from $6400 down to $2200 in 1967-68 [9 , p.206]. Instruction costs similarly ranged from $2400 down to $740 [9 , p.202]. The schools in that study, it should be noted, are a fairly homogeneous group of forty-eight private four-year liberal arts colleges.

While such figures as these can be questioned on the basis that definitions vary widely (there is wide variation among schools in their choice of cost items included in "Instruction", for example) another concept, used in this study, does not allow this definitional looseness. This is classroom teaching cost, the faculty salary cost of actual classroom instruction. In 1969-70 this cost varied from $1472 down to $262 per student.

What causes such variations in costs? As already suggested, we can list a number of explanatory factors. Variations in class sizes are one; average class sizes vary from as high as 29 students per section at one of our schools down to 14 at another. The more widely-used student teacher ratio ranges from 25.3 down to 8.1*. The Golden Years showed a range of 19.1 down to 7.4 [9, p. 66].

Faculty teaching loads vary similarly. Faculty members, after adjusting for non-teaching assigned duties, averaged 360 classroom hours in 1969-70 at several schools but only 156 at one. Faculty salaries ranged from $13,400 down to $8,500 at the lowest non-religious school and down to $5,600 at the bottom of the entire scale.

Such variations place a heavy burden on the policy planner, who must construct programs (of institutional aid, for example) which aid those institutions in need without at the same time rewarding inefficiency. Yet in the face of the kinds of variations noted above it is difficult to separate those costs which are in some sense appropriate from those resulting from inefficiency.

Suppose, for example, a school is moving toward smaller average section sizes. Does it do so because of a feeling that this signifies excellence which, for reasons of prestige, the college (or its faculty) seeks? Is it bad management, that offerings have perhaps proliferated to the point that the more esoteric are attended by only a handful of students or is it poor scheduling? Perhaps a drop in enrollment, or even a slackening of the growth rate, catches the college unaware with too large a faculty, or expansion plans too far advanced to alter. Are faculty costs rising unnecessarily due to competition among colleges for faculty [4, p. 99-110]?

While all these factors are obviously at work, we think there are more fundamental issues which take precedence. The most important of these is the college's "constituency", i.e., the total community (including its own students, faculty, and administrators) which it serves.

We suggest that the wide variations noted above are a response to this constituency. Programs of federal assistance will be unsatisfactory, in our opinion, to the extent that they fail to account for high-vs. low-cost college constituencies. In this view, high per student costs do not imply inefficiency if the college is serving a high cost constituency and even a low cost college may be inefficient if the aspirations of its students can be satisfied at significantly lower cost.**

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* A certain degree of manipulation is possible, however, with student-teacher ratios. See Chapter 3.

**We are not optimistic about the prospects for defining and quantifying cost measures based on schools' "outputs". Economic returns to education are increasingly being questioned by economists. For one thing these measures leave the value of many women's higher education quite ambiguous where they may enter the job market only briefly if at all. In any case certain intangibles, such as parental satisfaction and institutional prestige, are also outputs but are extremely difficult to quantify. Recent work aimed at developing some output measures appears to have been more successful (possibly unintentionally) in highlighting the difficulties than in making progress toward definitions.[14]

The campus visits, described above, produced the collective impression that all colleges, except perhaps the most recently established, make their decisions with a very clear perception of the constituency they serve. Furthermore, those decisions will reflect the desires of their constituency.

What this means is that "higher education" has perhaps done a better job of adapting to national needs for higher education than is generally realized. Although we may feel uncomfortable with a system which relies so heavily on the kinds of social and parental (i.e., "constituent") pressures described in, say, the HEW task Force Study of March 1971 [7 especially Chapter 2], it is possibly because we have failed to recognize the extent to which the colleges, the students, and the community have come to terms.

The college which accepts a large proportion of students who are dubious about attending in the first place will not place many academic demands on them and might offer more in the way of social programs. Thus the needs of both parents and students can be satisfied. One college, for example, characterized its students as "coming from blue collar families anxious to have their sons move upward in social and economic status"; its programs reflect this group's needs. Another college's students come from relatively well-to-do families but have had trouble "fitting in" elsewhere; the program there is academically demanding but very loosely structured. Some schools which are relatively isolated geographically serve student populations which are highly homogeneous in terms of their socioeconomic status and outlook; that outlook is accommodated in those schools' programs.

Administrators, too, have their needs. J.P. Newhouse, in another context, proposes a theory which examines the effects of institutional decisonmaking based on prestige rather than on cost-effectiveness criteria [11]. For state schools, in addition, the legislature is a member of the constituency which must respond to a set of voters which is only partially coterminous with the set of parents whose children are seeking a college education.

To talk about differing constituencies is idle, of course, unless the differences have cost implications. Our work, admittedly preliminary, shows that there is indeed a relationship between the two. Of the many college characteristics analyzed in this study, the average Scholastic Aptitude Test (SAT) scores of entering freshmen appears to be more closely related to per student costs than any other of the variables considered. Instruction costs, in fact, appear to be more closely related to SAT scores than to more direct indicators such as faculty salaries, tuition paid, or average class sizes. Instruction costs will increase by about $1 per student for each point increase in SAT averages. In addition, analyses of budget allocations show that the institutions' decisions on the manner in which they allocate their resources will depend more significantly on average SAT's than on any of a dozen related variables.

Type of control is a distant second in terms of its "explanatory power" and variables such as level of federal support, enrollment, and religious affiliation lag far behind.

Our purpose in considering SAT's in this light is not so much to argue for the adoption of this as the sole analytical criterion as to point out that a college constituency, differentiated here only by SAT as an example, does have cost implications. In short, the categories now widely-used to classify colleges (type of control, enrollment, level) must be augmented to reflect this diversity among various college constituencies. Such distinctions can be quite important, since the costs of college, as shall be noted in Chapter 3, appear to be more a function of these characteristics than of most others.

For purposes of analysis we define a set of classifications which reflect in shorthand form schools' constituency characteristics, viz., "academic", "utilitarian", and "general". In using this method of classification, we focus on the fact that the provision of college education "appropriate to the needs of students" implies the necessity of providing diverse kinds of college education despite the fact that some of these may be much more expensive than others.

By "academic", we mean those institutions which stress academic achievement and in which academic competition is pronounced and frequently severe. A high proportion of the graduates of these schools continue into graduate school where they tend to seek advanced degrees in academic or scholarly fields. These schools are usually the most selective in their admissions; entrance exam scores are well above national averages. Individual attention, low student faculty ratios, small class sizes, and low teaching loads prevail. These colleges are expensive.

The "utilitarian" schools are those which attract students who see them as leading to graduate professional schools or into rather specific career areas such as engineering and technology. Graduates go into teaching or into graduate programs such as law, business administration or social work. These colleges are least expensive.

The "general" schools find their students among those who are not the best qualified academically and who are perhaps not ready to make a career commitment. They are, however, motivated either by themselves or their parents to "get a college education", as much, often, for its social value as for any career value which it offers. These colleges are largely oriented toward the reinforcement of traditional values at a more sophisticated level than the high schools provide.

Beyond the admittedly general descriptions given above, we choose to avoid specifying hard and fast criteria for classifying the schools in this sample. The specification of any school's type is, to put it bluntly, subjective and purposely vague. Suffice it to say that the schools in this survey were categorized prior to the analysis; nothing in the analysis led us to alter any of the original classifications.

In adopting this typology we do not wish to reject "type of control" completely since the latter classification assumes importance in any analysis of revenues. The fifty colleges in our sample divide among these dual classifications as follows:

	Academic	Utilitarian	General	Total
Public	2	10	8	20
Independent	9	4	3	16
Religious	2	-	12	14
Total	13	14	23	50

The financial analysis which follows reflects both of these typologies.

III. FINANCIAL ANALYSIS

One begins an analysis of the cost of college with an awareness that colleges appear to be in a severe cost-revenue squeeze. It does not take long to realize that both "costs" and "revenues" are slippery concepts and that a great deal of adjusting and defining must precede any analysis. Funds set up for purposes long since forgotten linger in the ledgers and transfers among funds constitute a sort of cost accounting subculture.

Our approach was to examine each budget at the most detailed level available and determine then which of nineteen revenue and expenditure categories it belonged. Transfers which did not reflect real resource allocations were simply ignored. In this way, we were able to achieve a degree of comparability among our colleges. In fact, this comparability proved crucial,--it made it possible for us to establish that there are indeed cost differences among colleges. With this analysis of differences it is then possible to analyze what makes up these costs and to construct some indices of what we loosely call "financial health."

The analysis of the questions "why do costs vary so among schools?" shows how the college "constituency" can have an impact--and it also shows that there is a great deal of room for management improvement at many schools.

A final section combines our analysis of revenues and expenditures into an overall index of financial health. This index is analyzed in relationship to a number of other variables--the conclusion is that financial health is not deteriorating as rapidly as might be supposed, but that many institutions' pursuit of unrealistic goals may be pushing them into financial difficulty.

A. Expenditures

Table 2 shows where the money goes. The statistics exhibit sufficient variability to preclude our reaching strong conclusions concerning trends. There is little doubt, however, that "instruction" constitutes by far the major item in the cost of college, with "auxiliary services", "administration", and "facilities O & M" following at a distance. This remains true even when we apply our definition of instruction, which is much more limiting than that which is customarily used.

Trends which might be noted are the rising shares going for "public service" and "staff benefits" and the declining importance of "auxiliary services."

	Year beginning Fall:		
Expenditure Type*	1967	1968	1969
Instruction	29.7%	30.2%	30.1%
Research	1.2	1.4	1.4
Library and Audiovisual	4.0	4.0	4.0
Facilities O & M	11.2	10.6	11.2
Administration	16.7	16.3	16.6
Student Services	2.8	2.8	2.6
Student Aid	7.2	7.5	7.3
Public Service	3.3	3.5	4.0
Staff Benefits	3.2	3.6	4.0
Auxiliary Services	20.7	20.1	18.8
	100.0%	100.0%	100.0%

TABLE 2. Distribution of Expenditures: 1967-70

Figure 3 shows graphically that the rate of growth of expenditures appears to have slowed slightly over the period. As we have noted in Chapter 2,

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* The standard deviations of percentages for instruction, auxiliary services, administration, and facilities O & M are 9.1, 8.1, 3.8, and 3.4, respectively. Standard deviations of computed means are, respectively, 1.6, 1.5, 0.7, and 0.6.

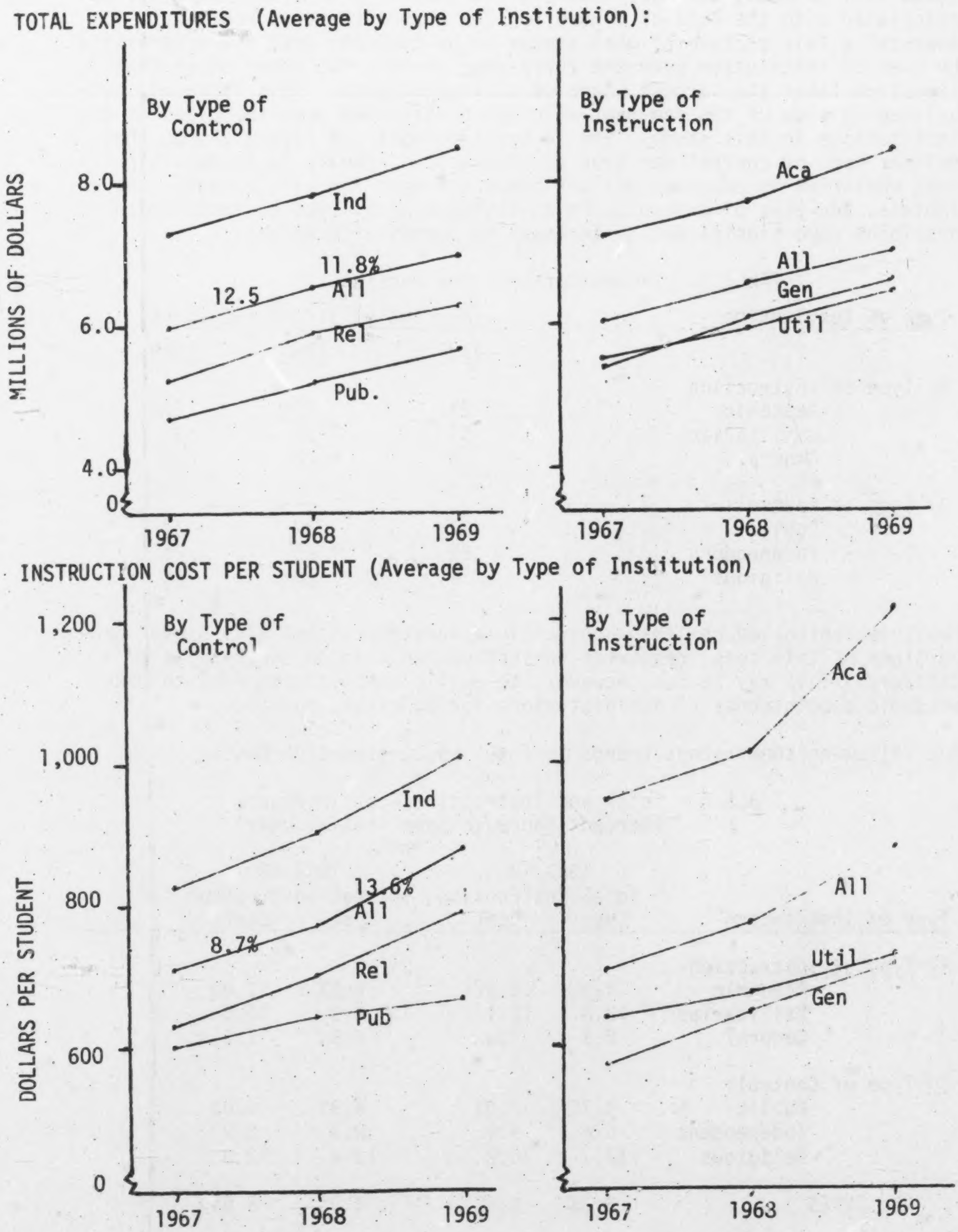

FIGURE 3. Total and Per Student Cost Trends

costs vary so among colleges that a great deal of precision should not be associated with the data of Figure 3. The graphs there do represent, however, a fair picture of what appear to be dominant cost characteristics by type of institution over the three-year period. We noted above that instruction takes the largest share of college budgets. This is hardly surprising in view of the dominant role which classroom teaching plays at the institutions in this study. The instruction costs in Figure 3 show that neither type of control nor type of instruction appears to produce significant variation in absolute dollars about the mean for all colleges. Nevertheless, analysis of expenditures on instruction by type of institution discloses some significant differences in budget allocations:

TABLE 3. Expenditures on Instruction

Type of Institution	(Percent of all Expenditures) 1967	1968	1969
By Type of Instruction:			
Academic	27%	27%	26%
Utilitarian	31	32	31
General	28	28	29
By Type of Control:			
Public	37	37	37
Independent	25	25	25
Religious	30	28	28

Publicly-controlled colleges apparently allocate substantially higher proportions of this total resources to instruction than do other types of colleges. This may be due, however, to public schools' tendency to make academic appointments of administrators for budgetary purposes.

The following show recent trends in Total vs. Instruction Costs:

TABLE 4. Total and Instruction Cost Increases
(Percent increase over initial year)

Type of Institution	1967-68 Total Cost	1967-68 Instruction Cost	1968-69 Total Cost	1968-69 Instruction Cost
By Type of Instruction:				
Academic	4.0%	5.3%	8.8%	7.8%
Utilitarian	12.8	12.1	8.9	10.6
General	6.7	7.9	9.5	7.5
By Type of Control:				
Public	4.7%	7.0%	6.9%	5.0%
Independent	6.6	9.1	8.3	8.9
Religious	17.1	10.2	13.4	12.8
ALL TYPES	8.3%	8.8%	8.9%	8.6%

In fact, the only schools for which the rule appears not to hold are the religious schools. It is likely that this may be true for them only because they are confronted by declines in enrollments which reduce instruction costs without similarly reducing many fixed costs.

All in all, these figures confirm those of other studies which show the cost of college to be rising at the rate of 8-12% per year.

B. Dissecting the Cost of College

What are some of the characteristics of recent sharp increases in the cost of college? For one thing, teaching costs,* which constitute 25% of all expenditures, have increased at a rate greater than expenditures as a whole, 15.9% from 1967 to 1968 and 13.1% from 1968 to 1969. The cost of classroom teaching involves three variables, teacher salaries, teaching loads, and class sizes. Each of these will be discussed in detail below, but the cumulative impact of year-to-year changes in each variable is shown in the following components of change summary:

TABLE 5. Components of Change in Teaching Costs

	% Change from Initial Year	
	1967-68	1968-69
Attributable to:		
Increase in average salary	8.2%	8.2%
Decrease in teaching hours	7.3	(1.4)
Decrease in average class sizes	.4	6.3
Total Cost Impact	15.9%	13.1%
Enrollment growth	6.2	3.0
Cumulative Per student Cost Change	9.7	10.1

That is, 55-60% of the total increase in classroom teaching costs is attributable to salary increases, with the remainder divided between decreases in teaching hours and decreases in class sizes. In other words, slightly over half the increase is due to inflation and slightly under half due to declines in productivity.

Compared with the increase in cost of instruction per student noted in the preceding Section (8.7% and 13.7%, respectively, for each of the two periods) classroom teaching cost increases ran ahead of instruction costs earlier and lagged in the latter period. By any criteria, however, the rate of increase accelerated during the whole period with the increase in the latter period attributable to productivity declines.

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*Classroom teaching cost is the portion of faculty members' salaries allocable to the specific courses they taught. Adjustments are made for part time instructors and for non-teaching functions such as department chairmen, counselling, etc. While many other costs may be subject to variable interpretation classroom teaching costs, as defined here, is the cost which is least subject to varying definitions. For all schools classroom teaching cost averages 85% of "instruction" costs and 25% of total current expenditures.

We might well digress here to observe that arguments for faculty salary increases which exceed the cost of living are justified on the grounds that since teaching productivity is essentially fixed, the larger increases are the only means by which the increased productivity of the economy as a whole can be shared. In fact, however, the economist would make the case that the total remuneration increases should include the increase in leisure implied by the decreases in hours and class sizes. Obviously, productivity can be increased by increasing classroom teaching load and class sizes. Arguments that the quality of output would suffer in such a case are, at best, difficult to demonstrate.

1. Faculty Salary Levels

Faculty salaries, quite properly, constitute the largest single cost element in higher education. We have already noted that classroom teaching costs are 25% of all costs; and the variation among colleges is small enough to give us some confidence in applying this 25% figure to all four-year colleges. As salaries rise they obviously exert strong upward pressures on the cost of college, and they are increasing, by over 8% in each of the change periods covered by this study. There is evidence, however, that this upward movement moderated in the current school year (1970-71).

As Table 6 shows, the most rapid increases in public school salaries came at a time when other schools' increases were slowing. Because the upward shift in public college salaries occurred while private schools were holding down the percentage increases in their own faculties' salaries, that shift has generally been perceived as a threat by the private schools. It is more probable, based on the campus interviews, that the sharp increase in public college salaries may only represent the problems legislature-controlled systems have in responding promptly to market conditions. The private schools still lead public schools in salary gains over the three-year period.

By the nature of their mission, academic institutions must exercise leadership in maintaining relatively high faculty salaries--which they succeeded in doing over the period. Meanwhile, the general colleges advanced their salaries from 79% of the academics' in 1967 to 82% in 1969. Utilitarian schools just held their own at 92-93% of academics' salaries.

Table 6 Faculty Salary Trends

Type of Institution	Average Salary			Percent Change*	
	1967	1968	1969	1967-68	1968-69
By Type of Instruction:					
Academic	$10,155	$10,853	$11,733	7.1%	8.5%
Utilitarian	9,447	10,000	10,829	5.8	8.5
General	8,056	8,907	9,592	9.4	7.8
By Type of Control:					
Public	$ 9,601	$10,142	$10,991	4.9%	8.6%
Independent	9,423	10,442	11,156	11.1	7.0
Religious	8,106	8,795	9,582	9.4	8.3
All Types:	$ 9,193	$ 9,879	$10,715	8.2%	8.2%

2. Teaching Loads**

It is in teaching loads that the most marked variations among colleges occur. Adjustments in policy with respect to teaching loads, lengths of sessions, and assignment of non-teaching duties are much less visible and usually less controversial than adjustments in salary, yet they have important consequences for college costs. Ironically, most schools do not really know what their average teaching loads are--especially in annual terms--despite the fact that numbers of hours spent by instructors in the classroom seem to be closely related to institutions' financial health. We suggest that too much attention is given to improving student/

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*The average fraction change presented is the mean of changes for each school rather than the change between average salaries each year. Average salaries are for classroom teaching.

**Teaching loads, in this analysis, are measured in terms of the number of hours instructors spend in the classroom; while faculty members have many other responsibilities, most would concur that this is their principal function--particularly at institutions selected for this study. To the extent that other responsibilities are formalized, we have made adjustments in the classroom hours to reflect those responsibilities. To account for variations in lengths and numbers of terms and weekly classroom hours, we compute total hours spent in the classroom during the complete school year. Since each college has its own policies concerning teaching loads, we attempted to explain deviation in hours only in terms of colleges' own norms. Faculty salaries in the analyses used here are those salaries directly ascribable to classroom hours spent in teaching specific courses or sections. Credit granted by the institution for non-teaching duties has been subtracted and appropriate adjustments made in total salaries to reflect this subtraction.

The following data summarize trends in teaching loads:

TABLE 7. Average Classroom Hours By Year

Type of Institution	1967	1968	1969
By Type of Instruction:			
Academic	279.1	248.3	232.5
Utilitarian	352.2	371.5	387.2
General	310.7	296.8	302.1
By Type of Control:			
Public	378.9	380.6	352.9
Independent	281.3	272.6	275.4
Religious	290.6	316.5	307.8

One may observe that the typologies selected for study have a great deal to do with whether significant relationships emerge. Data organized by type of control are not particularly indicative of trends. Although the three types exhibit differences in absolute numbers, they fail to demonstrate any persistent trends over the period.

By type of instruction, however, it is evident that the academic institutions are committed as a group to the diminution of annual teaching loads, which for them dropped over the period from 279 hours per year to 232. This drop would produce, other things being equal, a 20% increase in the cost of college at these institutions. One need not look further than this table to see where the utilitarian institutions derive their strength; they managed to increase teaching hours for staff members by 10% from 352 to 387 hours per year. The general schools, between the others, show no pronounced trend.*

In general, the decline in academic teaching hours appears to have been offset by increases in those of the utilitarian institutions. We might have expected the utilitarian colleges to respond to financial pressures in this way, viz., by simply increasing teaching loads to hold the cost line. Academic colleges are impelled by the nature of their goals to increase the research time available to their faculties at the expense of teaching hours.

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*Each of the averages (232, 387, 302 hours in 1969) had a standard deviation of 30.

The trends in teaching loads are less closely paralleled by concurrent shifts in student/faculty ratios:

TABLE 8 Comparative Student/Faculty Ratios

Type of Institution	1967	1968	1969
By Type of Instruction:			
Academic	10.9	10.5	11.2
Utilitarian	16.9	18.0	17.1
General	16.2	14.9	14.5
By Type of Control:			
Public	18.1	17.8	20.8
Independent	12.3	12.6	12.3
Religious	16.6	15.3	14.8

The student/faculty ratio will be a function of teaching loads, class sizes, and student class loads. The latter is approximately the same from school to school. The former two seem to move together rather closely, and one is about as good as the other for predicting student/faculty ratios. Although this ratio is a widely-used measure of academic quality, it is subject to considerable manipulation. For example, the total number of academic appointees is customarily used to compute the ratio. However, adjustment for non-teaching responsibilities can produce definite upward shifts in the ratio. State institutions in particular, operate under sets of rules which make appointment of academic personnel much easier than appointment of administrators. As a consequence the colleges shift the former into administrative jobs without, however, making the corresponding adjustment to student/faculty statistical indicators. In the case of one college, for example, the nominal ratio is 25:1, but after adjusting for actual teaching hours is 30:1. Increases in this indicator of 10-15% are typical, but 20% increases are common, after adjustment.

3. Class Size

The final determinant of classroom instruction cost is class size. Generally the trend is down as shown in Table 9 on the following page. The decline in the proportion of large sections (31+ students) in general schools coupled with the increase in small (1-10 students) sections spells financial trouble, since there is every indication that such a shift was unplanned. The utilitarian schools, on the other hand, although reducing the proportions of large sections managed to prevent an offsetting increase in numbers of small sections.

Small class sizes are both a cause and effect of financial difficulty. Declines in enrollments can have severe cost repercussions unless strong management measures are taken to reduce the total number of sections offered.

Table 9. Class/Section Size: Average, and Distribution by Class Size

Type of Institution	1967				1968				1969			
		No. of Students				No. of Students				No. of Students		
	Avg.	1-10	11-30	31+	Avg.	1-10	11-30	31+	Avg.	1-10	11-30	31+
By Type of Instruction:												
Academic	20	35.2%	50.0%	14.7%	20	33.8%	51.1%	15.1%	18	35.1%	51.6%	13.2%
Utilitarian	25	21.6	47.0	31.6	26	21.9	47.4	30.5	25	22.2	48.7	28.9
General	23	23.7	50.3	25.9	22	27.5	48.6	23.7	21	31.4	48.6	20.1
By Type of Control:												
Public	23	22.4	51.7	26.1	25	20.4	50.6	29.2	24	32.9	53.3	13.8
Independent	22	30.4	50.1	19.3	21	30.7	50.4	18.7	20	32.1	46.1	21.4
Religious	23	26.2	46.3	27.2	21	29.8	46.4	23.7	20	32.3	47.6	20.1

Generally, and contrary to expected reactions to a cost squeeze, class sizes have declined over the study period. This decline has taken the form of shifts toward smaller class sizes resulting from class proliferation, expansion of independent study programs, and trends toward seminar-like environments for undergraduate education.

As elsewhere, different types of institutions pursue class size policies in accordance with differing objectives. The academic schools naturally tend to lead the way toward smaller class sizes while the utilitarian institutions keep theirs relatively high. The differences among the three types of schools are statistically significant.

One additional set of observations is appropriate. Academic institutions have apparently achieved a "mix" of section sizes which allows a stable one-third to be small. In the face of national trends for seminar-type education, independent study, etc., the general institutions are responding in an expensive way, viz., by expanding the numbers of small sections in order, in our opinion, to emulate the academic colleges. As we would expect, the utilitarian colleges are successfully resisting the trend. We would suggest, however, that both academic and utilitarian colleges have so clarified their roles and the type of education they are attempting to provide that they have long since established a class-size "mix" appropriate to their objectives.

While we have noted that the general institutions are expanding their numbers of small sections it must be pointed out that the religious-controlled institutions, which are heavily represented in the general category, are exhibiting a similar trend. This view permits a somewhat different interpretation of results, viz., that modest declines in enrollments at those colleges are shrinking class sizes. The "expansion" of numbers of small classes in this case is probably quite involuntary.

The relative importance of varying sizes of programs can have an effect on average class sizes. Colleges which enroll a higher proportion of their majors in Humanities courses, for example, will tend toward larger average class sizes than those which do not, since Humanities sections can be larger than those in other fields.

As Table 10 shows, academic institutions offer almost half of their sections in Humanities and a fourth of them in Social Sciences. Both are higher than other schools' averages. Even where the academic colleges do offer education and/or vocational training, the proportion of these to other classes is very small. The utilitarian schools (more or less by definition) offer a large proportion of their work in Vocational-Occupational training and relatively less in Humanities. Both utilitarian and general colleges offer more encouragement to Education courses.

Table 11 indicates characteristics of class sizes by program and type of instruction. Although academic colleges have slightly fewer of their sections in Physical Sciences, the proportion of small sections is noticeably greater than offered by the other types of colleges. In Social Sciences

Table 10

Distribution of Class Sections by Subject Area
1969

Type of Institution	Physical Sciences	Social Sciences	Humanities	Education*	Vocational Education*
By Type of Instruction:					
Academic	22%	25%	48%	4%	3%
Utilitarian	24	21	36	10	18
General	23	19	43	10	9
By Type of Control:					
Public	27%	21%	39%	10%	11%
Independent	22	25	42	6	12
Religious	22	19	46	7	9

*Based on distributions of courses only for those schools which have programs in these fields. I.e., averages do not include any "zero" observations.

TABLE 11

Class Size Distribution by Subject Area
1969

(Percent of all classes in subject area)

	Physical Sciences			Social Sciences			Humanities			Education			Vocational Education		
Type of Institution	1-10	11-30	31+	1-10	11-30	31+	1-10	11-30	31+	1-10	11-30	31+	1-10	11-30	31+
By Type of Instruction:															
Academic	45	44	11	31	48.	21	36	54	10	34	48	18	22	68	10
Utilitarian	22	50	28	16	39	45	28	52	20	32	46	22	22	53	25
General	34	48	18	25	39	36	34	50	16	28	45	27	32	44	24
By Type of Control:															
Public	21	56	23	17	40	43	29	54	17	23	57	20	37	43	20
Independent	40	45	15	28	45	29	33	54	13	27	55	18	37	46	17
Religious	39	43	18	29	38	33	37	47	16	31	44	25	19	51	30

there is relatively greater dependence on large sections (21%) but nothing like the dependence of the other schools on them.

Utilitarian schools make relatively more use of large sections both in the Social Sciences and in Humanities. General colleges, in this as in other measures, seem generally to lie between the other two types.

This line of inquiry primarily illustrates that the extent to which class sizes can be altered depends to some extent on the way in which they are distributed among the subject areas. A shift in interest from Physical Science to Social Sciences, for example, would result in an overall lowering of class sizes for all types of schools, while a similar shift to Humanities would have less of an impact. It is also evident that if students begin flocking back to the study of Physical Science, reversing the trend of a few years ago, the cost implications could be quite severe.

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An institution which is financially beleaguered will ordinarily attempt to reduce expenditures, either through a reduction in the quality of its product, classroom instruction in this case, or through increased productivity. The foregoing analyses suggest that colleges generally are doing neither. Economies such as increases in teaching loads and class sizes and reductions in numbers of small sections appear not to have been made. Indeed, the opposite seems to have been the case.

The evidence suggests, of course, that not all institutions are responding in the same way. The academic institutions, for example, are responding to sets of goals which require their leadership in initiating undergraduate independent study, a seminar environment, and low student/faculty ratios.

Utilitarian colleges, by their nature, can resist these kinds of trends. It is the general institutions, caught in the middle, who are experiencing the greatest number of conflicting pressures.

C. Revenues

Where do colleges get their money? Table 12 shows the revenue sources for colleges in our sample. Tuition and fees are by far the major source of college income and despite rapid increases in state outlays over the past few years that source still provides less than half as much as student fees at our schools. Any such presentation is, of course, incomplete unless we take type of control into account, as we do in Table 13. Income from Auxiliary Services is excluded from Table 13 because it is more or less equal for all types of institutions. In summary we see that the public colleges derive only 16% of their income from students and nearly 60% from government sources. Independent schools are most heavily dependent on students' payments with substantial portions contributed by endowment income and gifts (8.8% and 10.4% respectively in 1969-70).

TABLE 12

Revenue Distribution

(Unweighted means of corresponding percentages)
1967-1969

	Percent		
	1967-68	1968-69	1969-70
Revenue Source:*			
Tuition/Fees	35.4%	35.4%	36.2%
Endowment	5.0	5.4	5.4
Gifts	7.4	7.7	8.0
State Appropriations	16.3	15.4	16.1
Other Government	3.9	4.9	5.0
Research	2.3	2.5	2.6
Educational Services	3.3	3.2	2.8
Other	1.6	1.5	1.3
Auxiliary Services	24.9	23.9	22.6

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*For tuition/fees, auxiliary services, state, and gifts (1969) the standard deviations are, respectively 18.6, 8.5, 24.6, and 6.9.

TABLE 13.

Revenue Distribution by Type of Control

(Unweighted means of corresponding percentages)
1967-1969

	Percent		
	1967-68	1968-69	1969-70
Public:			
Tuition/fees	15.3%	15.4%	16.5%
Endowment	0.2	0.7	0.6
Gifts	0.4	0.8	0.5
Government	57.6	56.8	58.0
Independent:			
Tuition/fees	45.4	46.5	47.6
Endowment	5.7	9.0	8.8
Gifts	10.4	10.7	10.4
Government	2.2	2.0	2.5
Religious:			
Tuition/fees	44.1	42.0	41.4
Endowment	4.4	5.1	5.4
Gifts	11.5	11.8	14.1
Government	2.7	4.9	5.6

Religious institutions rely on student payments to a slightly smaller degree than independent schools, with the difference being made up by gifts to the former. This gift income is largely in the form of contributions from the controlling religious group.

Colleges, through a variety of policy decisions can markedly influence expenditures, as we have noted in previous sections. They have substantially less control over revenues. First, it is evident that if a college is heavily dependent on tuition income, and if its enrollments decline, the school can quickly come under financial strain.

The effects of increasing tuition rates are already beginning to show up in enrollment declines:

Table 14. Tuition and Enrollment Growth

	Public			Independent			Religious		
	1967	1968	1969	1967	1968	1969	1967	1968	1969
Average Enrollment	3198	3586	3841	1868	1938	1880	1694	1729	1704
Growth		12%	7%		4%	-3%		2%	-1%
Average Tuition Fee Paid	$266	$289	$328	$1496	$1648	$1854	$950	$1057	$1200
Growth		9%	13%		10%	13%		11%	14%

Student payments at public schools are low enough that a 13% increase can be absorbed. A comparable percentage increase at the private schools, however, turned enrollment increases, modest as they were, into enrollment declines. The trend has led the president of one major metropolitan university to suggest that unless state institutions begin changing competitive tuitions, private schools will be forced out of business [10].

Second, tuition increases tend to be inherently self-limiting. That is, unless the college is willing to eliminate the less well-to-do from the ranks of its students, every increase in tuition implies that students receiving financial assistance would then require additional aid equal to the tuition increase. Furthermore, in the face of higher tuitions, additional students would then need assistance.

Third, state appropriations seems to follow a logic all their own in reflecting a mixture of political and academic pressures. The rapid growth of the past decade in this source of revenue seems now to have "turned the corner," as we will show in the next section.

Fourth, although Table 13 shows that private schools have been quite successful over the past few years in maintaining the proportion of revenues derived from private sources (primarily in the form of gifts and grants), this performance may be short-term. It turns out that many colleges have a select list of donors (including, for the religious schools, their religious group) to whom they can turn when the financial going gets rough.* These donors' generosity has not yet been confronted by the scale or regularity of demands which will arise if present trends continue unchecked. Often, too, gifts are one-time emergency donations which are given on condition that finances somehow be put in order.

We defer to the following section the discussion of relative rates of growth in revenue, their comparison with growth in expenditures, and the implications for institutional finances.

D. College Financial Health: An Overview

No single measure can convey a complete picture of all colleges' financial situation. Circumstances peculiar to specific colleges or classes of colleges may make the same figure mean very different things to different colleges. We have adopted, as the best all-around measure the extent to which total revenues fall short of or exceed current operating expenditures. For the colleges in our study we found that revenues covered 106% of expenses in 1967-68, 106% again in 1968-69, and 105% in 1969-70. In dollar amount, there was a net revenue of $134 per student in 1967-68, $147 in 1968-69, and $125 in 1969-70. Since later years' indices are not statistically different from those of earlier years,** it is necessary to conclude that colleges' financial well-being has not significantly worsened over the period.

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*For example, the deficits of one college have been routinely made up by a single donor during the past few years. A projected deficit of $150,000 this year, however, may put both his generosity and his bankroll to a rather more severe test than either he or the college had contemplated.

**For most statistics, data from 31 institutions (10 public, 13 independent, 8 religious) are used. Where budgetary data are combined with other data types (e.g., costs per student, requiring both budget and enrollment data), some of which may be lacking, the number of observations may be less.

More detail shows that all types of institutions are affected more or less equally, both among types and over years.*

Table 15

Operating Ratio

Type of Institution	Revenues as Percent of Expenditures		
	1967	1968	1969
By Type of Instruction:			
Academic	104%	104%	101%
Utilitarian	98	110	108
General	104	107	107
By Type of Control:			
Public	104%	110%	107%
Independent	101	106	104
Religious	104	102	105

---

* Not surprisingly, the differences are not statistically significant. This lack of statistical significance is anticipated. The operating ratio mixes expenditures, which are affected by type of instruction, and revenues, which are affected by type of control.

On the other hand, an operating ratio of 105% is hardly munificent, since our definitions of total revenue and current operating expenditures exclude capital requirements.* That is, the 5% margin of revenues over expenditures must cover the capital costs of college. Put another way, the student is contributing only $125 per year toward the capital costs of his education.

Therefore, while it is obvious that an institution which is not covering its expenditures must necessarily face closure, a college which is just meeting expenses must eventually shut down also, because its facilities will eventually depreciate to the point where they can no longer sustain operations.

We noted above that outlays for current operations increased 13.5 from 1967 to 1968 and 12.4 from 1968 to 1969. Only one of the schools experienced an actual decline in expenditures in either of the periods. Four colleges experienced declines in revenues; gross revenues grew, however, 13.4% from 1967 to 1968 and 12.3% from 1968 to 1969.

Taken over all three years, revenues grew 25.7% and expenditures 25.9%.

These data do not support the suggestion that revenues are growing at a dangerously slower rate than expenditures. The difference in growth rates between the two are not only statistically insignificant, but when viewed over the whole three-year period are negligible.

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*Operating expenditures exclude expenses not directly linked to the current year's operations. Thus excluded are debt service, transfers to capital accounts, reserves, or endowment, new additions to capital accounts, restricted funds, and depreciation (in those rare cases where the college includes it as an expense). On the revenue side, revenues from sale of debt, gains or losses from revaluation of assets, and withdrawals from reserves or endowment are excluded. It is difficult to separate many revenues into "capital" and "operating" components because of their "fungibility," i.e., ease with which either can be effectively used as the other. For example, gifts restricted to facilities can be used to cover costs of "college development" if the college chooses to capitalize those costs--or funds restricted to future year use can effectively be used as current revenue by committing them to repayment of current year "loans" from endowment.

Again, considered by type of institution:

Table 16

Revenue and Expenditure Growth By Institution Type

Type of Institution	Percent Increase over Initial Year			
	1967-1968		1968-1969	
	Exp.	Rev.	Exp.	Rev.
By Type of Instruction:				
Academic	10.0%	10.1%	13.8%	11.1%
Utilitarian	13.5	12.6	14.8	12.6
General	16.5	19.4	10.2	10.5
By Type of Control:				
Public	18.0%	22.7%	16.8%	13.9%
Independent	9.6	8.4	10.4	8.1
Religious	16.4	14.9	10.8	13.0

The "independent" institutions as a group are evidently undergoing the most severe financial squeeze, with expenditures consistently expanding more rapidly than revenues. The "public" colleges' revenues grew rapidly from 1967-1968 but were curtailed in the period 1968-1969. The decline in revenue growth rates for public schools from 22.7% to 13.9% probably marked (if we want a specific point in time) the end of unrestricted growth of the public schools which had persisted for over a decade.

These figures also suggest that growth in public institutions was at the expense, at least relatively, of the independent and religious colleges. If so, then the decline in public school growth rates relative to other schools might be an indication that the period during which the major burden of U. S. higher education was shifting to public colleges is drawing to a close.

Averages, of course, conceal a very wide range of values, from those which hint of near disaster to those which indicate affluence. At the bottom end of the scale were 8 institutions (of 31) whose revenues failed to cover expenses, one by some 10%. At the other end, 5 colleges covered expenses plus 10% or more,--and one had revenues of 139% of expenditures. But as in the case of the operating ratios, the average growths in expenditures and revenues conceal a number of cases where financial difficulties are severe and pressing, or where difficulties have developed rapidly. Thus, for example, one school was experiencing an 8.7% increase in expenditures in the face of a 3.5% decrease in revenues. Obviously, a situation in which four schools experienced declines in revenues while only one was able to reduce outlays suggests the need for management action.

* * * * * * * * * * *

In summary, we cannot support the conclusions elsewhere [3, 8, 9] that higher education in general is facing a discouragingly bleak financial future. It is evident that many colleges are in trouble. But we would agree with Clurman [4] that of those which are having problems, there are strong indications that the difficulties are on the expense side rather than on the revenue side. Many of the factors contributing to their financial malaise are, in fact, internally controllable. Low teaching loads, small class sizes, and shifts of expenditures away from instruction, for example, are all under the control of the colleges themselves in a way which enrollments and many types of revenue, are not. Jellema, for instance, develops at some length the proposition that revenues will only increase slowly [8], a conclusion which our results support. Virtually no attention is given to possibilities for cutting expenditures.

This is where encouragement by Federal programs is needed. First, the utilitarian institutions are obviously the most "cost-effective" (loosely used) of all institutions. If our goal is to prepare for specific occupations, these schools are efficient. If, at the same time, we wish to maintain centers of academic excellence, it is necessary to face up to, and meet, the special costs required there. Finally, it is the general institutions which try to do both, and which are running into accelerating costs in pursuit of goals which are not adequately defined. We can only suggest that they are unwisely attempting to mold themselves in an Ivy League model with a non-Ivy League constituency.

IV. FEDERAL STUDENT AID

During the period covered by this study the federal student aid programs were virtually the only mechanism for providing federal assistance to the four-year colleges. Despite the fact that this income is restricted, it represented a source of funds which, for colleges seeking to expand their aid programs, were essentially discretionary. By freeing resources which might otherwise be encumbered by competing priority demands, the federal aid programs have served the dual purpose of aiding the student and the institution.

A. Impacts of Federal Aid Programs

The impacts which the federal aid programs have had on both students and institutions can be divided into a discussion of benefits and problems. Statistical analyses of the budget allocations at all of the schools studied have indicated that federal student aid as a proportion of tuition and fees has a definite, although weak, impact on the pattern of expenditures at these schools. Federal aid as a variable alone cannot be associated with changes in the pattern of expenditures, however, when cross-classified with other factors, it is shown to affect allocations. In fact, a very strong association between federal aid, enrollment change and resource allocations was determined to be statistically significant, an association which suggests that federal aid is permitting colleges to grow by providing them more leeway in the allocation of their resources. Assuming then that benefits do accrue to institutions from federal aid programs, it is possible to assess more precisely the impact which changes in this program have upon participating institutions.

Beginning with what the colleges surveyed have themselves allocated to student aid, we note that expenditures dropped for all schools on an average by 1.5% between 1967 and 1968 but rose dramatically between 1968 and 1969 by almost 17%. Examining the amount of federal aid provided by the College Work/Study program, the Educational Opportunity Grant Program and the National Defense Student Loan Program, we find that the average amount of aid awarded to the schools in the study increased by only 3% between 1967 and 1968, and then decreased by 1.7% in 1969. At least part of the increase in student aid expenditures by the schools was thus in direct response to the decline in federal funds. A relative indication of the impact of changes in the aid programs is provided by consideration of the trend in per student charges (tuition and fees) and the amount of federal aid awarded to each student. The table following presents a summary of the changes in charges per student at the institutions examined.

TABLE 17. Changes in Per Student Charges

(Percent increase over initial year)

By Type of Instruction	67-68	68-69
Academic	9.4	12.4
Utilitarian	5.3	19.7
General	13.1	9.6
By Type of Control:		
Public	8.6	13.4
Independent	10.1	12.5
Religious	11.2	13.5
All Types	10.2	13.0

These statistics, when contrasted with the relatively small increase in federal aid per recipient as shown below, well illustrate the financial demands which the federal funding, or the lack thereof, has on both the student and the institution.

TABLE 18. Changes in Average Amount of Federal Aid Per Recipient

(Percent increase over initial year)

By Type of Instruction	67-68	68-69
Academic	.1	2.9
Utilitarian	-.5	3.4
General	-4.6	6.2
By Type of Control:		
Public	-6.2	5.3
Independent	4.3	2.2
Religious	-5.8	6.7
All	-2.2	4.9

The margin of additional charge over federal aid increment is the margin which either the student must make up himself, or which the school as well as the students paying full tuition must cover. Another way of representing the margin of additional cost is to consider the changes in per student charge with the increment of federal aid per enrollee.

TABLE 19. Changes in Federal Aid Per Enrollee

(Percent increase over initial year)

By Type of Instruction:	67-68	68-69
Academic	3.3	-1.6
Utilitarian	.6	4.1
General	.7	2.2
By Type of Control		
Public	- .9	2.0
Independent	8.1	-4.4
Religious	-2.4	7.6
All Schools	1.5	1.4

B. Financial and Institutional Characteristics

Assessment of the impact of these programsalso demands consideration of the financial status of schools at which federal funds are cut or where they are least significant. Using the cost measures explained in the previous section it was determined that schools with a precarious financial situation, those with revenue/expenditure ratios just slightly larger than 1.00, are the schools at which the average federal aid per recipient is the lowest among all schools considered. It is at these schools where increased financial demands will be placed both on the resources available to the schools and on those students with the ability to pay.

A number of other institutional characteristics were found to be associated with varying levels of federal aid. Though not one hundred percent accurate for all cases, schools receiving the least federal aid per recipient were characterized by enrollments under 1,000 students, an average class size under 20, a student/faculty ratio under 12:1, a less competitive admissions policy, an average entering freshman SAT score of 400 or under, and a consistent trend towards decreasing enrollment. It is of interest to note also that schools with a student body drawn primarily from low income families allocate the least amount of federal aid to each recipient from all the schools considered. Affiliation with the Catholic Church was the only statistically significant characteristic of schools allocating large amounts of federal aid to each recipient.

C. Policy Considerations

A major concern expressed elsewhere but often repeated in conversations with school administrators is that the present structure of assistance programs as they relate to those college costs which are passed on to students is making college financing increasingly difficult for middle income families. Private schools, since they have the freedom to do so, have tended to impose what amounts to a "tax" on those students who pay full tuition in order to assist those who are financially less able. Not only does this practice accelerate the elimination of students from middle income families, but it raises some question as to why colleges should be expected to pursue such income redistribution policies at all. To do so places them in the position of having to make quasi-governmental decisions concerning who shall be asked to carry the major burdens of the cost of college.

Another problem area is the aid burden imposed on the four-year colleges by junior-year transfers from community colleges. First, these students presumably living at home during their first two college years, are suddenly confronted with a new set of costs. Furthermore, they may have received aid at the community college, not only directly but through the very low tuitions permitted by state support. However, the typical four-year college attempts to plan its student aid for the whole four years of its entering freshmen; to "pick up" these transfers would mean cutting assistance to those who entered as freshmen.

A program which, at a minimum, would permit the transferring junior to continue receiving his aid "package" at the new school should be considered. Indeed, any transferring student who has received aid should be entitled to continue receiving it rather than impose the additional burden on the receiving institution.

And finally, it is significant to ask whether the particular characteristics of a given school should be considered along with the characteristics of the student body ~~in~~ the determination of the amount of aid to be allocated to a school. A plea often heard from school officials is for the provision of more student aid for the reason, by now clear, that federal aid does directly benefit the institution. If more federal aid is to be provided, then the financial and institutional characteristics of a school should be considered, as they are keys both to the financial need of an institution as well as the cost-effectiveness of its management. This latter point is particularly important if assurance is to be made that the aid provided will contribute to the flexibility of administrators in meeting the financial demands made upon their school, rather than to costs which are already inflated.

V. EFFICIENCY AND MANAGEMENT

It is widely assumed that substantial improvement in colleges' financial situation is attainable by improved management. While there is a great deal of room to progress in this area, there are inherent limitations which must be considered. In this section we discuss some of these limitations and then go on to review problem areas where improvements appear to be feasible.

In earlier sections two concepts were developed which we used to illuminate aspects of the cost of college, viz., that of financial "health" and that of the "high cost" college. In the case of the former we were concerned with the extent to which revenues either fall short of or exceed expenditures; in the latter case we suggested that the constituency which a college serves tends to set its costs more or less independently of policies pursued by the college. The two tend to work at cross purposes. Although differences in financial health among academic, utilitarian, and general institutions were not shown to be statistically significant, many characteristics associated with one or another of the three types do appear to be associated with financial condition.

The financially marginal schools (i.e., with operating ratios less than 100%) are characterized by smaller enrollments, low teaching loads and class sizes, and relatively heavy dependence on tenured staff. They also tend to be those which allocate relatively less of their budgets to instruction and more to student aid, public service, and research. We associate most of these characteristics with academic, high cost institutions. The "affluent" colleges (i.e., with operating ratios of 110% or higher) demonstrate opposite characteristics and, in addition, show relatively low participation in Federal student aid programs, tend to accept virtually every applicant, have comparatively low SAT score averages, and have low costs per credit hour.* Utilitarian colleges tend to show many of these characteristics.

The dilemma is apparent. Some colleges are high cost because of the constituency served and in so doing are getting into financial difficulties. Other colleges are high cost because they are inefficient. The ideal program would provide generally unrestricted assistance to the former, but assistance to the latter should come with a package of management improvement incentives.

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*For our sample (for the most part consisting of 31 of the 50 colleges), each of the noted characteristics is significant at the 95% level of confidence.

The problem of separating high costs and inefficiency remains to be solved. It is not a simple one. Suppose, however, that we construct a model of institutions' costs (per student) which takes account of all those characteristics which are shown to have an impact on costs,--and which uses the colleges' own data to estimate the appropriate parameters. (One example, SAT scores, was described above, where it was noted that each point increase in SAT score appeared to accompany a dollar increase in the cost of college.) That is, suppose a regression equation relating costs to characteristics is constructed. Such an equation would give us an estimate of what each college's costs "should be." The estimated cost would, of course, take account of the colleges' constituencies. In those cases where actual costs were found to exceed the estimated cost, we might safely assume that there is room for management improvement.*

So far, "efficiency" has been perceived in terms of potential federal policy. What, from an institution's point of view, are some of the "management improvements" which appear to be feasible?

A number have already been described, at least implicitly, in preceding sections. They are all quite humdrum. Course offerings cannot be allowed to proliferate beyond certain limits, teaching loads and section sizes have to be maintained, and salary increases need to be contained.

It turns out that even such modest proposals exceed some colleges' current capabilities; there is wide variation in colleges' capabilities both for managing themselves and for responding to external management initiatives. We might imagine, for example, a progression along which, first, there is a basic ability to measure actual expenditures on relatively specific resources. Not all colleges have attained this modest level of sophistication.**

The next level involves some development of management information. The familiar cost per student and per credit hour are best known, analyses of student socio-economic characteristics and so forth much less so. Accounting systems at this level also tend to focus more on controllable items of expenditure rather than on detail for its own sake.***

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*A full development of this line of inquiry is beyond the scope of the current study. The approach is sufficiently promising to justify continuing analysis, which will be undertaken during the current year.

**The accounting data for a number of our sample were remarkably rudimentary. Sufficiently so, in fact, that it was obvious that relatively basic precepts of "management" could not be practiced because management information does not exist. Surprisingly, of those few colleges' accounting systems which fall in this category, all are state colleges. (One must hasten to add, though, that most state colleges' systems are excellent.) In many states, apparently, colleges respond only to the barest minimum state reporting requirements; in some states those minima are usually inadequate to the management task.

***But consider, for example, the widespread use of part-time faculty. It is generally assumed that part-time faculty are less costly than full-time. Our analysis shows that in the majority of cases this is not so. (Recall that payments for part-time teaching are weighted in our averages according to hours taught.) In fact, it often occurs that the weighted average salary

The next step is program budgeting--still far in the future for most colleges of the type covered in this study. First, objectives and goals are yet to be defined by too many colleges, to say nothing of the programs needed to achieve them. Second, the concept of a program is and will remain muddy for a variety of reasons. College administrators will have to learn, for example, that the provision of a program structure is not at all the same as program budgeting. And most will be dismayed when they discover how useless some of the structure elements can be for management purposes, or that other elements are not accounted for at all.

If there is one single area in which college management has the most room for improvement, it is in the area of making realistic projections of enrollment and in planning to accommodate these enrollments. For example, approximately half the colleges in this sample indicated that earlier enrollment projections had had to be modified in the light of later developments--downward. A significant, although small number of colleges have enrollment goals which, in our opinion, are unrealistically optimistic. These latter schools tend to be in the public sector and also tend to be in geographical areas where private schools have traditionally carried the major burden of higher education. Many enrollment projections are clearly made not with the pool of high school graduates in mind, but with too-firmly etched a picture of the last decade during which students sought places rather than the other way around. And too many schools unrealistically feel that they can easily increase enrollment (and tuition income) as one means of overcoming financial difficulties.

A brief case description will demonstrate how colleges can be trapped by errors in planning. A three-year history is summarized in the following table. The numbers reflect realistically the experience of a number of our schools.

	1967	1968	1969
Total Enrollment	1563	1714	1675
Average Class Size	20	23	17
Number of Faculty Members	57	65	81
Average Faculty Salaries	$ 8,700	$ 9,050	$ 10,880

(continued from previous page) for instructors exceeds that of assistant professors--and sometimes even that of associate professors. In one case, the full time equivalent salary of an instructor came out to $25,000 per year. Colleges where this occurs, we have found, are surprised,--it does not occur at colleges where strict controls are maintained.

Initially, with an enrollment of 1563 in 1967 and average class sizes of 20 the situation was presumably stable, although with higher than desired teaching loads. An increase in enrollments in 1968 put upward pressure on student-teacher ratios and average class sizes jumped from 20 to 23 (an unusually large change, based on the experience of others in our sample). The response was an extremely rapid increase in faculty size in order to serve the increased numbers of students, an increase achievable by increasing salaries 20% from 1968 to 1969. The enrollment surge proved to be short-lived, unfortunately, and in 1969 enrollments declined; the average class size fell back to 17. This college was thus left approximately back where it was in 1967, but with a larger-than-desirable faculty and with salaries across the board higher. It was also left with no very appealing adjustment alternatives.

One important problem which might often be overlooked is that this type of miscalculation produces an almost irreversible upward adjustment in salaries and in numbers of faculty members on tenure. Recall that not only are the newly attracted faculty members' salaries higher, but all faculty salaries have to be adjusted upward. Adjustments to declines in enrollments are substantially more difficult than adjustments to increases.

As one final area for improvement, it appears likely that to limited analysis of many non-instructional programs may be leading some schools into more than appropriate involvement in public service activities.* For example, the needs which summer, evening, and extension programs meet are seldom spelled out; programs which are established finally meet those needs. Presumably market criteria largely determine whether these programs are viable, in the sense that direct instructional costs are usually met from tuition. However, should public service programs carry their fair share of administrative and facilities costs their financial viability would be a much shakier proposition.

The economist is particularly skeptical of assertions that such costs are necessarily fixed; our analysis shows that administrative and physical plant operation and maintenance together constitute a constant one-third** of all expenditures, public service and auxiliary services included. If the latter expand, the former will expand proportionately.

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*"Public service" here includes summer, evening, and extension programs. These are almost always budgeted apart from the regular day sessions and direct costs are usually met from tuitions or from specific governmental grants. Generally the indirect costs are not covered although grants will frequently carry an additional allowance to the college for that purpose.

**Specifically, the two averaged 27.8% of all expenditures in 1969, with a standard deviation of 3.6.

There is, in fact, some evidence to show that increased outlays generally will tend to increase, rather than decrease per student administrative costs. One regression analysis showed, for example, that administration costs per student go up by $77 for each additional $1 million in total outlays. One interpretation is that as the total budget expands, greater-than-proportional administrative costs are generated. That is, expenditures on non-instruction activities do result in additional administrative costs, the effect of which is to raise per student costs of total administration. Whether he pays his own way or the state pays on his behalf the student is then put in the position of supporting administrative costs of services he may not want or even use.

* * * * * * * * * * * *

In short, we would conclude that the schools experiencing the greatest financial distress may well benefit from a more realistic analysis of its constituency and the real costs of providing the education sought by that constituency.

VI. PROGRAMS AND POLICIES

When one views the needs and the opportunities, and when one then starts listing the things which might be done, the result is apt to be something of a grab bag of program ideas. We prefer to present recommendations which are more in the nature of considerations which the higher education policy-makers might wish to keep in mind as he does his job.

As is amply noted above, we do not share the unrelieved pessimism of many analysts of higher education finance. In particular, we doubt that the current version of what has come to be continuing "crisis" will result in any significant lessening in the availability of educational opportunity.

For one thing, revenues somehow have managed to keep up with the growth in expenditures which has occurred over the last decade. Since that decade was one of more rapid growth than we will see in the future, then, we would argue revenues have already met a more severe test than in anticipated in the future.

Furthermore, most analyses have tended to assume that past expenditure growth rates will persist into the future. Based on present expectations of enrollment growth, that assumption is not valid. In any case, analysis of sources of that growth reveal that much can be done internally to moderate the impacts of inflationary cost increases.

These statistical conclusions are supported by the accumulated impressions of the campus interviews. Administrators are not obsessively concerned. They are aware that under increasing financial duress, historical trends toward lower productivity, for one thing, can be reduced and that to do so would pull the increases in the cost of college into line with or only slightly ahead of general increases in the cost of living.

This is not to say that the federal government should not provide assistance to colleges. Rather, it is to say that aid should be selective. Not all colleges need assistance, and those who do,do not necessarily need the same kind of assistance.

In particular, we have noted that different college constituencies generate demands for types of education with widely varying price tags. Our "utilitarian" schools, for example,are a "best buy" by any criterian simply because they serve a constituency with well defined objectives which will be academically undemanding in their attainment. But given this any one of them may not necessarily be "efficient".

It is, however, feasible to separate colleges which are inefficient from those which are simply "high cost". For the former, we are concerned that general institutional assistance will have only transitory effects on financial health. A program of planning and management grants is indicated.

Let us reemphasize, however, that each college must be free to vary its programs to meet the needs of its own constituency. Although we have suggested that year-to-year productivity declines have been a major contributing factor inflating the cost of college, we have carefully avoided any inter-college comparisons of productivity.

Policy should be similarly neutral in this respect. Once a college assumes a particular role for itself (and it is the task of management and planning to confirm the realism of that role) a number of other decisions--class sizes, total enrollment, faculty salaries--automatically follow. The college, in responding to the needs of its clientele, is best qualified to determine how to meet those needs. What we do not accept is that within a college over a period of time the response should necessarily always be in the direction of lower productivity.

High cost institutions may well require permanent assistance, particularly if, as our evidence suggests, high costs are associated with high college qualifications and motivation. Federal assistance will be especially needed as more of the highly qualified but economically disadvantaged enter the high-cost institutions.*

Much of our analysis suggests that general programs of institutional aid depend on formulae which are not likely to direct that aid to institutions most in need. Such a problem may well be endemic to institutional aid. Until it is resolved, we should move slowly, concentrating (as implied above) on special problem areas.

It may well be that student aid is the preferable long-term approach. Administrators are very favorably disposed toward the federal student aid programs, perhaps because they are thus absolved of the responsibility for mediating conflicting claims of the academic departments on this particular resource. To the private schools, especially, the federal student aid programs provide a means by which they can move to fulfill their social responsibilities to the disadvantaged. Jellema has noted the importance which many private colleges place on their ability to do also [8 , p.15].

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*Denison has argued [6] that it is inappropriate to expend public funds unequally on youths according to their scholastic ability. In particular he points to the inequity of accepting for college the student who did well in high school and excluding altogether the one who did poorly. He would thus fault the California system where much more is expended, per student, on the academically highly capable who are accepted by the University than on those who are accepted into the State College system--which in turn costs more per student than the Community Colleges. The latter have virtually no academic requirements for entry.

What we are suggesting is that different kinds of education have different price tags (e.g., science vs. history or classics--where class sizes are small--vs. psychology--where they are large) and that we prefer to let the student choose.

Present systems of student aid are unsatisfactory in many respects, however,--especially where funds are administered by the college. The colleges then must make quasi-governmental decisions concerning who is to be assisted and, in the case of private schools, who will bear the major tuition burden. The position is not unlike that which has been found to be so unsatisfactory in the delivery of medical services, wherein the doctor presumably scales his fees based on his personal appraisal of the patient's ability to pay.

In addition, we have been subjected to a barrage of studies which attempt to determine "need", usually revolving around some computation of the student's family's ability to pay [e.g., 4, 12].

In an era when we are transferring more responsiblity to college-age youths rather than taking it away, such approaches will seem increasingly anachronistic. The issues are sufficiently complex that some degree of simplification seems to be needed. One form of simplification would be to separate the cost of college, per se, and the cost of subsistence while attending college, (nominally, auxiliary services). If nothing else, such a separation guarantees that the marginal outlays required to pay for higher education are in addition to basic needs which the society would provide anyway. At worst, it would relieve the colleges themselves of the responsibility of deciding whether it is appropriate to pay total cost for few, or only the additional costs of attending college for many.

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The data made available by The Cost of College study makes feasible the evaluation of many different program alternatives for federal institutional aid. Further work is needed to explore these alternatives.

PART I

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PART II

THE COST OF COLLEGE

COLUMBIA RESEARCH ASSOCIATES

Cambridge, Massachusetts

PART II

THE COST OF COLLEGE

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INTRODUCTION

Part I of The Cost of College summarized significant data developed in the course of the study and presented the principal findings and conclusions of the report. In addition, Part I drew upon a number of statistical tables and analyses not included in that section. Part II provides a description of all of the tables used in developing the material for Part I as well as a technical description of the statistical analyses used.

The data analyzed were obtained from fifty four-year colleges, generally classified as 4- and 5-year and masters-degree-granting colleges. The data obtained were from the colleges' own records, rather than as responses to questionnaires. There is, of course, a great deal of room for errors of interpretation and, indeed, for errors of every kind in such an undertaking. Where appropriate, mention has been made of the problems encountered in collecting and processing the data which have some effect on the validity of statistics computed from the data and the conclusions based on these statistics. The statistical analyses described also begin to answer such questions as how valid are the school's own records and what are some of the alternative conclusions which might have been supported by the same data interpreted differently.

Section I presents a number of statistical tables which summarize the major items of data collected and developed for the study. Section II provides statistical documentation on the major financial, instructional, and federal aid characteristics used in the analysis of finances in Part I. Sections III and IV describe the stepwise regression and the analysis of variance used to examine the patterns of resource allocation at the fifty colleges studied.

I. STATISTICAL DATA

Introduction

Chapter I presents a number of tables which were used to explore certain relationships among various school data in the development of the material for Part I. The tables are presented here to provide the analyst with a summary of part of the material gathered for this study as well as to present several interpretations of the specific school data. Data obtained from these tables were also used in the selection of variables considered in the regression analyses and the factor analyses of Chapters 3 and 4 of this Part.

Data requirements and data collection methodology are explained in the appendices to this part. It is appropriate, however, at this point, to consider some of the problems and difficulties encountered during the preparation of the data for the study as these problems have a direct impact on the quantity and quality of the data collected.

Data Collection

It was anticipated that of the three years considered for this study, data would be least available for the earliest years. This was not always the case. The availability as well as the quality of data varied according to the individuals responsible for maintaining these data and the particular administrative structure established for this effort. For instance, separate offices for institutional research or institutional data have been established at many schools in recent years.

To the greatest extent possible, effort was made to reconcile with school officials inconsistent statistics and statistics which appeared to vary wildly. In one particular data category, freshman statistics, data simply varied according to the administrative office used as a source. In part, this occurrence reflects the lack of any clear and consistently used definitions among schools, and even within a school. It is also a reflection of the fact that data can vary according to the specific purposes for which it is intended, viz., student recruitment, internal institutional profile, etc. Though CRA's campus interviewers were able to collect first-hand those source documents which would provide the data to fit our own definitions and eliminate a potential source of error in having someone unfamiliar with our definitions and procedures filling in data items, statistics were oftentimes inconsistent and highly variable.

Data Presented

The symbol "-1" appears in the tables where CRA was unable to obtain data which fit our definitions, or where data were not available. As many of the data items presented in the following tables are combinations of several other data items, all data items must be complete for a statistic to be presented. In this case and in the case where data were available to CRA, but were not incorporated into the statistical files, the symbol "-1" is also used. For the basic items of data presented in these tables, the following numbers of schools were as complete as possible.

Faculty data - 42 schools
Class data - 37 "
Budget data - 31 "
Student aid data - 50 "
Freshman data - 50 "
Enrollment data - 49 "

Each table is accompanied by a brief description of the specific data presented in the table.

Table 1

While average faculty salaries have increased regularly, considerable variation in the total impact of these increases does occur from college to college and even year to year within colleges. The data shown in Table 1 represent the relative changes in faculty salaries over the period from fall 1967 to spring 1970 (schools designated "10" under type of control are public, "00" independent, and "01" religious).

The first pair of columns indicates average faculty salaries as a percent of the previous year. The second pair shows total number of faculty as a percent of the preceding year. The third pair of columns shows the combined impact of the changes in number of faculty and average salary and is an index of total faculty cost. Changes in average faculty salary and number of faculty only partially offset one another for the majority of institutions. For those schools whose total cost factors vary widely, fluctuations are primarily the result of an increase or a decrease in the number of non-tenured faculty.

The last pair of columns, by dividing the preceding through by changes in enrollment, provide an index of per student cost changes. For most schools rising costs are only partially offset by increases in enrollments, and generally costs are increasing faster than enrollment.

Table 2

In this table average class size and standard deviations in class size are compared with instruction cost per student. Later multiple regression analyses show no significant correlation between class size and instruction cost.

Average class size does not vary by much between years for most schools, however, a slight trend towards decreasing class sizes is apparent. Standard deviations have increased indicating that although average class size has changed little, the range of class sizes has increased.

Table 1
Faculty Salary Cost Index
Total and per Student

College	Type of Control		Avg Fac Sal Pct Prev Yr		No. of Fac Pct Prev Yr		Cost Factor % Prev Yr Total		Cost Factor % Prev Yr Per St	
#	P-P	Rel	68	69	68	69	68	69	68	69
1	1	0	99	112	119	118	117	132	99	115
2	1	0	111	95	110	117	122	111	105	104
3	1	0	-1	-1	129	-1	-1	-1	-1	-1
4	1	0	-1	-1	-1	-1	-1	-1	-1	-1
5	1	0	102	102	109	113	111	115	90	110
6	1	0	115	93	91	148	104	138	90	123
7	1	0	106	104	104	111	111	115	102	112
8	1	0	102	113	115	123	117	139	103	102
9	1	0	-1	-1	-1	-1	-1	-1	-1	-1
10	1	0	102	110	133	118	135	130	116	120
11	1	0	104	109	96	85	99	93	100	83
12	1	0	94	127	138	81	130	102	115	89
14	1	0	107	105	102	108	109	113	100	95
15	1	0	108	112	110	119	119	133	103	110
16	1	0	-1	-1	122	122	-1	-1	-1	-1
18	1	0	-1	-1	-1	-1	-1	-1	-1	-1
20	1	0	100	111	102	105	102	116	101	114
21	1	0	103	109	113	98	116	107	109	110
22	1	0	105	110	119	111	125	122	108	110
24	0	0	113	109	98	97	100	106	95	110
25	0	0	107	113	96	92	103	104	104	105
26	0	0	-1	103	-1	114	-1	117	-1	111
28	0	0	108	108	102	102	110	110	107	111
29	0	0	107	103	98	110	105	113	105	112
30	0	0	103	110	109	107	112	117	113	115
31	0	0	125	101	119	98	149	99	136	91
32	0	0	107	105	96	103	103	108	98	108
33	0	0	103	107	112	108	115	115	102	120
34	0	0	114	100	97	110	111	110	104	104
35	0	0	-1	-1	-1	-1	-1	-1	-1	-1
37	0	0	-1	107	-1	107	-1	115	-1	99
38	0	0	112	105	92	114	103	120	-1	-1
39	0	1	108	97	98	120	106	116	109	132
40	0	0	128	96	103	84	132	80	140	79
41	0	1	107	111	100	85	107	94	119	115
42	0	1	130	138	101	89	132	123	146	146
43	0	1	-1	-1	-1	-1	-1	-1	-1	-1
44	0	1	106	109	99	117	105	128	101	128
45	0	1	112	96	98	92	110	88	112	89
46	0	0	-1	-1	93	120	-1	-1	-1	-1
47	0	1	97	111	137	98	133	109	130	116
48	0	1	111	112	123	87	136	98	147	101
49	0	1	94	-1	106	-1	99	-1	99	-1
50	0	1	106	109	110	110	116	120	103	115
51	0	1	99	103	109	109	108	112	114	99
52	0	1	99	108	118	104	117	112	101	123
53	0	1	126	100	107	114	135	114	133	100
54	1	0	111	102	130	97	145	99	-1	101
55	0	0	101	113	105	96	106	108	107	107
56	0	1	96	124	119	90	115	111	110	104

Table 2

Cost per Student and Class Size

College #	Avg Class Size 67	68	69	Std Dev Class Size 67	68	69	($) Instr Cost Per Stu 67	68	69
1	19	-1	21	15	-1	16	-1	-1	-1
2	-1	-1	-1	-1	-1	-1	737	775	758
3	-1	22	-1	-1	12	-1	-1	-1	-1
4	-1	-1	-1	-1	-1	-1	-1	-1	-1
5	28	31	29	19	24	24	422	598	431
6	-1	37	38	-1	37	60	794	747	732
7	-1	-1	-1	-1	-1	-1	-1	-1	-1
8	22	24	25	10	10	22	852	555	[illegible]
9	-1	-1	-1	-1	-1	-1	290	320	431
10	22	30	22	12	18	16	221	318	[illegible]
11	30	25	-1	33	19	-1	583	739	758
12	24	27	27	13	29	26	-1	-1	-1
14	15	16	15	21	20	19	938	1001	956
15	-1	-1	-1	-1	-1	-1	-1	-1	-1
16	-1	-1	-1	-1	-1	-1	-1	-1	-1
18	-1	-1	-1	-1	-1	-1	-1	-1	-1
20	26	24	-1	18	17	-1	-1	-1	-1
21	22	20	21	23	18	23	412	508	549
22	21	21	20	16	17	17	716	779	857
24	25	25	24	32	32	25	-1	-1	-1
25	26	24	24	43	39	46	393	475	550
26	-1	-1	-1	-1	-1	-1	507	589	[illegible]
28	29	28	-1	31	30	-1	657	737	799
29	22	19	19	20	15	17	1103	1081	1205
30	18	16	17	12	11	12	855	964	[illegible]
31	20	22	22	29	35	35	870	991	998
32	16	20	17	17	19	15	1109	1133	1256
33	26	25	24	14	16	14	573	603	[illegible]
34	18	18	15	22	13	12	919	1001	1118
35	-1	-1	-1	-1	-1	-1	1660	1821	1906
37	24	26	26	16	23	26	-1	-1	-1
38	-1	-1	-1	-1	-1	-1	-1	-1	1530
39	18	18	17	12	12	12	672	582	[illegible]
40	21	19	19	15	15	16	609	744	752
41	20	19	17	22	22	13	-1	-1	-1
42	16	15	14	15	14	13	496	720	652
43	25	-1	24	24	-1	30	-1	-1	-1
44	27	27	26	23	28	29	511	553	627
45	25	23	21	19	17	20	475	520	534
46	19	20	19	12	13	13	843	925	[illegible]
47	-1	19	17	-1	16	17	-1	-1	-1
48	21	24	18	20	63	25	494	572	612
49	23	20	20	12	12	11	-1	-1	-1
50	23	19	19	14	20	25	693	721	802
51	-1	-1	-1	-1	-1	-1	-1	-1	-1
52	30	29	26	18	22	18	-1	-1	-1
53	-1	-1	-1	-1	-1	-1	732	849	890
54	22	23	21	29	29	29	-1	-1	-1
55	18	17	16	39	40	49	1206	1262	1412
56	28	27	26	38	33	33	-1	-1	1

Table 3

Student/faculty ratios are a generally considered yardstick of the quality of the education provided by an institution. Statistics on this characteristic, however, often prove deceptive as definitions of "faculty" and "student" are left to the imagination of the reader.

The CRA methodology reduces instruction to actual classroom hours provided by each faculty member. Faculty who had administrative or other non-academically related duties are only counted in total faculty summaries in proportion to the amount of time actually spent in teaching. If student/faculty ratios are computed in this way and are compared with the nominal student/faculty ratio based on headcount, the ratios turn out somewhat less favorably.

The first group of three columns present the unadjusted student/faculty ratios and the second group of three columns, the adjusted ratios. At all schools for which data were available, adjusted ratios are 15% higher on an average than unadjusted ratios. Adjusted ratios also tend not to fluctuate as much between years as unadjusted ratios. Schools with the largest variations utilize faculty extensively in administrative positions. For the schools in this study, research is not at important non-teaching function.

Table 3

Student- Faculty Ratios

Total and Adjusted for Classroom Hours

College #	Stu/Fac Ratio-Unadj 1967	1968	1969	Stu/Fac Ratio-Adj 1967	1968	1969
1	15.2	15.3	14.9	-1.0	-1.0	-1.0
2	16.2	17.1	15.6	16.2	17.1	16.5
3	-1.0	11.9	-1.0	-1.0	13.6	-1.0
4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
5	18.0	20.4	19.0	18.1	20.4	19.0
6	16.3	20.7	15.7	16.3	20.7	23.0
7	21.3	22.0	20.4	21.8	22.6	21.1
8	15.8	15.6	16.2	18.8	19.3	19.2
9	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
10	30.5	26.9	24.7	33.4	28.7	25.4
11	18.0	18.7	25.2	19.2	19.9	25.2
12	21.7	17.6	25.3	27.7	21.8	30.4
14	8.6	9.2	10.1	11.0	11.5	13.2
15	18.6	19.4	19.7	-1.0	-1.0	-1.0
16	29.1	24.0	17.1	-1.0	-1.0	-1.0
18	-1.0	-1.0	22.9	-1.0	-1.0	-1.0
20	14.9	14.7	14.3	-1.0	-1.0	-1.0
21	19.4	18.3	18.2	22.6	22.4	21.5
22	14.4	14.0	14.0	14.6	15.0	14.6
24	11.4	13.5	13.4	-1.0	-1.0	-1.0
25	21.4	22.1	23.8	23.0	22.7	24.0
26	-1.0	23.0	21.4	-1.0	24.0	23.3
28	16.3	16.4	16.1	19.3	16.4	17.1
29	10.8	11.0	10.1	14.3	15.2	12.2
30	11.1	10.1	9.7	12.6	12.0	11.4
31	15.3	14.1	15.7	-1.0	-1.0	-1.0
32	10.2	11.2	10.9	12.1	13.2	12.2
33	22.3	22.5	20.0	-1.0	-1.0	-1.0
34	7.7	8.7	8.4	10.3	10.8	10.2
35	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
37	-1.0	15.8	17.0	-1.0	16.0	17.4
38	-1.0	-1.0	7.4	-1.0	-1.0	7.9
39	10.8	10.7	7.9	14.4	13.1	9.2
40	8.8	8.0	9.8	10.9	10.0	12.1
41	9.0	8.1	7.8	13.6	11.6	10.5
42	6.4	7.5	7.1	10.2	10.5	9.8
43	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
44	17.6	18.6	15.9	21.9	21.6	17.0
45	18.1	18.0	19.5	20.7	18.7	21.2
46	11.0	11.2	9.0	-1.0	-1.0	-1.0
47	14.2	10.6	10.1	14.3	10.7	10.9
48	23.7	17.9	19.9	32.1	27.4	40.8
49	28.5	27.0	-1.0	35.7	30.6	-1.0
50	14.3	14.8	14.0	-1.0	-1.0	-1.0
51	11.6	10.0	10.4	11.7	10.0	10.4
52	20.2	19.9	17.4	22.3	22.7	19.8
53	12.3	11.7	11.7	13.6	12.3	12.7
54	-1.0	10.8	10.9	-1.0	15.9	11.9
55	8.1	7.7	8.1	-1.0	-1.0	-1.0
56	13.2	11.5	13.7	14.9	13.5	15.4

Table 4

A range of factors are considered in this table which are thought to be indicators of or have effects on per student costs. They are in order across the page:

a. Type of control
   10 = public
   00 = independent
   01 = religious

b. Total cost (total expenditure) per student.

c. Instruction cost (as reported in budget) per student.

d. Average faculty salary.

e. Average SAT for 1969 entering freshman class.

f. High school rank expressed as the percentile standing in his high school graduating class of the median entering freshman.

g. Barron's index of competitiveness for entering freshmen expressed numerically, 1 representing the most competitive school and 9 the least competitive.

Regression analysis has indicated a strong correlation between total cost and instruction cost per student and the average SAT score for the entering freshman class. Schools with higher SAT averages tend to be more expensive in every respect.

A much weaker correlation was determined between cost per student, competitiveness, and high school standing. Where SAT averages are missing, schools do not require either the SAT or the ACT examinations for admissions.

Table 4

Cost per Student, Average Faculty Salary, and Cost Index

College #	Type of control	($) Cost per student	($) Instru cost per student	($) Avg. Fac. Sal. 1969	Avg. SAT 1969	H.S. Rank 1969	Barrons' Index
1	1 0	-1	-1	13119	515	-1	
2	1 0	2173	769	10162	292	-1	
3	1 0	-1	-1	-1	-1	-1	
4	1 0	-1	-1	-1	490	[illegible]	
5	1 0	1289	431	10015	419	39	
6	1 0	1720	732	11085	464	37	
7	1 0	-1	-1	11299	-1	-1	
8	1 0	1416	876	10705	456	-1	7
9	1 0	2015	431	-1	380	-1	
10	1 0	929	391	9063	-1	-1	
11	1 0	2006	769	10598	483	-1	
12	1 0	-1	-1	13072	484	18	
14	1 0	2756	966	10887	494	28	7
15	1 0	-1	-1	12616	501	29	7
16	1 0	-1	-1	-1	398	-1	
18	1 0	-1	-1	12145	484	-1	7
20	1 0	-1	-1	8511	400	-1	
21	1 0	2040	549	9746	420	-1	7
22	1 0	2123	857	11002	402	22	7
24	0 0	-1	-1	11716	335	27	
25	0 0	2354	560	9598	514	-1	
26	0 0	2866	596	10395	555	38	5
28	0 0	3023	799	12721	507	31	7
29	0 0	6144	1205	10262	-1	19	
30	0 0	3654	1038	11108	564	25	
31	0 0	5481	998	13387	624	17	
32	0 0	5768	1256	12798	674	12	
33	0 0	1681	699	10507	462	43	4
34	0 0	3949	1118	10874	597	-1	
35	0 0	6148	1906	-1	665	13	
37	0 0	-1	-1	9817	535	23	
38	0 0	4611	1536	10622	616	-1	
39	0 1	3378	835	8974	494	-1	
40	0 0	2784	752	7992	471	4[illegible]	
41	0 1	-1	-1	9124	588	22	
42	0 1	3253	862	10152	525	34	
43	0 1	-1	-1	-1	534	37	
44	0 1	2145	627	11094	525	31	7
45	0 1	2280	534	10183	433	-2	
46	0 0	3668	1091	-1	581	-1	
47	0 1	-1	-1	9156	491	29	7
48	0 1	2526	612	9525	483	-1	7
49	0 1	-1	-1	-1	518	41	
50	0 1	3443	802	11828	564	25	
51	0 1	-1	-1	12362	550	32	5
52	0 1	-1	-1	5564	461	33	7
53	0 1	2690	890	8152	504	-1	
54	1 0	-1	-1	11251	558	21	7
55	0 0	5402	1402	11987	642	-1	1
56	0 1	-1	-1	6370	407	39	

Table 5

Instruction cost per student and average SAT scores are compared in this table for the three years of the study. The standard deviation of the SAT average is also presented to provide an indication of the homogeneity of student capabilities as expressed by the average SAT.

A good correlation is again evident between average SAT scores and costs per student. The average SAT score for all schools in the sample remained relatively unchanged over the three year period considered. However, the standard deviation of individual SAT averages did fluctuate considerably for several schools. Changes in average SAT and SAT average standard deviation do not appear to be correlated with any pargicular change in cost per student, which uniformly tend to rise at all instutitions.

Table 6

Income from tuition and fees is presented as a fraction of total expenditures in Table 6 while the ratio of tuition and fees is alligned with total enrollment (second group of three columns) and the proportionate change in enrollment (last pair of columns). Presumably schools with relatively high tuition ratios and a slackening enrollment growth will be headed for financial difficulty in the future.

The schools with the lowest tuition ratios are publicly-controlled and have been in a period of enrollment growth.

Table 5

Cost per Student and Average SAT Scores

College #	($) Instru Cost/Stu 67	68	69	Average SAT 67	68	69	Std Dev SAT 67	68	69
1	-1	-1	-1	516	525	515	86	-1	[illegible]
2	737	775	768	293	290	292	93	[illegible]	[illegible]
3	-1	-1	-1	-1	-1	-1	-1	-1	-1
4	-1	-1	-1	483	478	490	86	83	[illegible]
5	422	398	431	-1	406	419	-1	77	74
6	794	747	732	474	471	464	67	79	-1
7	-1	-1	-1	-1	-1	-1	-1	-1	-1
8	652	855	876	470	464	456	71	75	[illegible]
9	290	329	431	-1	-1	380	-1	-1	52
10	271	318	391	-1	-1	-1	-1	-1	-1
11	593	739	768	448	460	483	-1	-1	-1
12	-1	-1	-1	534	525	484	69	82	[illegible]
14	998	1001	966	474	499	494	77	83	[illegible]
15	-1	-1	-1	505	506	501	-1	-1	-1
16	-1	-1	-1	373	382	398	96	84	112
18	-1	-1	-1	484	486	484	[illegible]	95	[illegible]
20	-1	-1	-1	383	391	400	78	96	[illegible]
21	412	508	549	417	419	420	[illegible]	80	[illegible]
22	716	779	857	481	486	492	69	66	74
24	-1	-1	-1	347	363	335	-1	-1	-1
25	393	475	560	504	490	514	74	78	[illegible]
26	507	589	596	550	549	555	86	75	[illegible]
28	697	737	799	-1	497	507	-1	83	[illegible]
29	1183	1081	1205	-1	-1	-1	-1	-1	-1
30	[illegible]	964	1038	568	563	564	74	76	[illegible]
31	870	991	998	619	618	624	69	87	[illegible]
32	1109	1133	1256	663	666	674	71	71	[illegible]
33	573	602	659	455	454	462	[illegible]	73	[illegible]
34	919	1001	1118	601	584	597	93	87	[illegible]
35	1660	1821	1906	664	665	665	80	65	[illegible]
37	-1	-1	-1	513	523	535	77	81	[illegible]
38	-1	-1	1536	-1	598	616	-1	-1	-1
39	672	682	835	507	520	494	86	86	[illegible]
40	609	744	752	498	463	471	93	91	[illegible]
41	-1	-1	-1	603	588	588	81	73	[illegible]
42	496	720	862	473	492	525	[illegible]	94	[illegible]
43	-1	-1	-1	520	551	534	82	83	[illegible]
44	511	553	627	-1	513	525	-1	90	[illegible]
45	475	520	534	415	437	433	94	85	[illegible]
46	843	925	1091	586	-1	581	82	-1	[illegible]
47	-1	-1	-1	506	500	491	83	86	[illegible]
48	494	572	612	494	488	483	74	85	[illegible]
49	-1	-1	-1	523	529	518	77	84	[illegible]
50	693	721	802	535	540	564	91	90	[illegible]
51	-1	-1	-1	569	570	550	[illegible]	83	[illegible]
52	-1	-1	-1	479	473	461	80	84	[illegible]
53	1115	1148	1274	497	512	504	[illegible]	93	[illegible]
54	-1	-1	-1	528	548	558	[illegible]	91	[illegible]
55	1206	1267	1402	658	698	642	79	74	[illegible]
56	-1	-1	-1	418	419	407	76	83	[illegible]

Table 6

Tuition Ratio and Enrollment Growth

College #	Type of Control P-P	Type of Control Rel	Tuition Ratio 67	Tuition Ratio 68	Tuition Ratio 69	Enrollment 67	Enrollment 68	Enrollment 69	Enrollment Pct Prev Yr 68	Enrollment Pct Prev Yr 69
1	1	C	-1	-1	-1	3594	4271	4886	1.19	1.14
2	1	0	12	11	15	1793	2088	2228	1.16	1.07
3	1	C	-1	-1	-1	6160	6656	7277	1.09	1.09
4	1	0	-1	-1	-1	1222	1444	1462	1.18	1.01
5	1	0	8	13	19	2914	3608	3795	1.24	1.05
6	1	0	7	7	10	862	993	1112	1.15	1.12
7	1	0	-1	-1	-1	7459	8061	8267	1.08	1.03
8	1	0	14	14	14	648	733	937	1.13	1.28
9	1	0	11	13	11	2332	2429	2266	1.04	0.93
10	1	0	19	29	21	2442	2848	3067	1.17	1.08
11	1	0	28	26	32	1634	1628	1816	1.00	1.12
12	1	0	-1	-1	-1	5891	6614	7627	1.12	1.15
14	1	0	15	16	12	531	579	690	1.09	1.19
15	1	0	-1	-1	-1	4731	5450	6588	1.15	1.21
16	1	0	-1	-1	-1	1281	1296	1129	1.01	0.87
18	1	0	-1	-1	-1	9124	9973	10373	1.09	1.04
20	1	C	-1	-1	-1	3869	3888	3946	1.01	1.01
21	1	C	13	12	14	1648	1761	1714	1.07	0.97
22	1	C	27	27	27	2693	3115	3448	1.16	1.11
24	0	0	-1	-1	-1	2997	3142	3026	1.05	0.96
25	0	C	76	76	71	2076	2051	2043	0.99	1.00
26	0	C	42	43	47	1822	1795	1902	0.99	1.06
28	0	C	62	61	61	4165	4275	4272	1.03	1.00
29	0	C	1	1	1	1375	1377	1382	1.00	1.00
30	0	0	47	47	44	610	605	619	0.99	1.02
31	0	0	37	40	42	1578	1737	1888	1.10	1.09
32	0	C	31	33	32	1373	1450	1450	1.06	1.00
33	0	0	99	91	89	3944	4447	4257	1.13	0.96
34	0	0	67	65	70	597	637	673	1.07	1.06
35	0	C	39	40	42	2123	2119	2206	1.00	1.04
37	0	0	-1	-1	-1	2238	2415	2793	1.08	1.16
38	0	0	51	50	57	-1	-1	552	-1.00	-1.00
39	0	1	44	40	35	964	935	820	0.97	0.88
40	0	0	48	56	59	889	837	851	0.94	1.02
41	0	1	-1	-1	-1	1012	910	749	0.90	0.82
42	0	1	52	42	40	620	561	475	0.90	0.85
43	0	1	-1	-1	-1	1530	1546	1522	1.01	0.98
44	0	1	41	43	43	3382	3528	3539	1.04	1.00
45	0	1	52	49	47	886	865	859	0.98	0.99
46	0	C	52	51	46	942	898	864	0.95	0.96
47	0	1	-1	-1	-1	1304	1333	1253	1.02	0.94
48	0	1	48	48	46	1685	1559	1511	0.93	0.97
49	0	1	-1	-1	-1	3621	3618	3582	1.00	0.99
50	0	1	31	32	33	1607	1820	1895	1.13	1.04
51	0	1	-1	-1	-1	845	802	903	0.95	1.13
52	0	1	-1	-1	-1	2503	2901	2650	1.16	0.91
53	0	1	45	46	48	2062	2095	2392	1.02	1.14
54	1	0	-1	-1	-1	-1	4278	4176	-1.00	0.98
55	0	C	38	37	37	1293	1285	1303	0.99	1.01
56	0	1	-1	-1	-1	952	991	1058	1.04	1.07

Table 7

The cost of college can be adversely affected by high attrition rates. Not only are educational investments made in individuals who do not complete, in the sense of receiving a degree, but intrayear attrition complicates staffing problems and leaves resources underutilized.

While the foregoing is a hypotheses which can be tested, this table shows the relationship between acceptance ratios (Total Accepted/ Total Applications) and intrayear attrition rates. The latter are measured in terms of declines from fall to spring in total number of credit hours earned. Indirectly, we wish to know whether high acceptance rates are associated with high attrition rates. Freshman enrollments are given as a means of evaluating impacts in terms of students enrolling.

There appears to be little correlation between acceptance ratios and attrition. The measure of attrition fluctuates markedly at so many institutions that this measure must be questioned. In part fluctuations may be explained by class data which were not validated or properly evaluated by the school at CRA's request. Also, the acceptance ratio is subject to question as a measure of selectivity, as there can be real differences in the qualifications and characteristics of high school students applying for admission. Applications tend to be made on the basis of the potential students' own self evaluation and academic objectives, so acceptance ratios do not apply to the same applicant population for one school as opposed to another.

Table 8

Table 8 establishes the relationship between federal student aid programs and both total school enrollment and numbers of aid recipients. These figures are used to establish classifications of aid levels for analysis of resource allocations. Presumably, high levels of federal aid have provided means for internal resource allocations which might not otherwise have been made. Actual number of recipients and amounts of federal aid provided to each school are presented in Table 19.

Inasmuch as the allocation of federal aid is based on administrative decisions by each school, this table also provides an indication of how aid is allocated at the various institutions surveyed.

Table 7

Acceptance Ratio and Attrition

College	Acceptance Ratio			Freshmen			Fall-to-Spring Attrition		
#	67	68	69	67	68	69	67	68	69
1	67	74	57	-1	-1	-1	3.1	-1.0	-3.1
2	78	75	99	596	713	659	-1.0	-1.0	-1.0
3	-1	-1	-1	2177	2081	2229	-1.0	27.2	-1.0
4	-1	92	87	-1	-1	-1	-1.0	-1.0	-1.0
5	99	99	99	1539	1769	1790	7.3	11.8	11.7
6	57	58	70	323	329	379	-1.0	-19.2	10.8
7	-1	-1	-1	-1	-1	-1	-1.0	-1.0	-1.0
8	53	65	64	199	249	295	9.2	-11.8	-10.8
9	99	72	58	695	670	513	-1.0	-1.0	-1.0
10	-1	-1	-1	1343	1376	1387	-2.9	-31.3	-19.2
11	-1	-1	-1	488	516	614	2.7	17.0	-1.0
12	30	30	38	1335	1040	1142	-1.0	-1.0	-1.0
14	79	71	61	312	288	364	-1.0	6.4	11.4
15	-1	-1	-1	2098	1987	2548	-1.0	-1.0	-1.0
16	81	78	75	428	450	344	-1.0	-1.0	-1.0
18	-1	-1	-1	-1	-1	3137	-1.0	-1.0	-1.0
20	-1	-1	-1	1632	1329	1692	14.2	5.3	-1.0
21	95	92	97	807	814	702	10.9	5.7	1.7
22	69	-1	-1	1039	1134	1246	3.5	0.9	-71.6
24	63	70	53	1093	1118	860	0.2	-3.0	-2.5
25	67	64	62	514	499	627	1.8	0.0	-2.5
26	64	66	67	390	332	376	-1.0	-1.0	-1.0
28	87	88	92	1252	1247	1269	14.7	10.0	-1.0
29	46	46	50	413	384	443	4.5	0.6	11.1
30	50	57	61	151	170	205	10.5	3.8	1.5
31	51	54	44	425	434	481	6.2	2.2	-5.1
32	-1	-1	-1	388	486	372	8.8	7.1	-3.0
33	56	64	65	-1	-1	-1	14.6	18.7	3.8
34	62	73	74	172	211	273	5.9	8.8	5.3
35	43	40	-1	560	587	585	-1.0	-1.0	-1.0
37	45	46	45	628	741	735	8.2	8.1	21.6
38	-1	-1	29	-1	-1	-1	-1.0	-1.0	-1.0
39	56	63	64	-1	-1	-1	7.5	7.6	10.4
40	86	88	74	257	268	284	3.7	-1.0	2.3
41	68	81	79	267	172	198	-2.6	6.9	2.1
42	81	85	89	176	141	114	12.0	13.0	-12.7
43	70	87	80	204	255	171	3.9	-1.0	6.0
44	-1	-1	-1	1041	1051	1021	76.2	76.9	74.9
45	54	-1	-1	280	281	290	8.8	6.7	6.2
46	83	-1	89	237	238	211	10.8	6.3	1.1
47	93	-1	92	333	417	345	-1.0	2.8	17.3
48	-1	-1	-1	413	366	380	8.4	17.1	10.0
49	66	63	70	446	426	486	4.7	3.0	33.6
50	93	81	62	642	721	587	-1.0	15.6	18.9
51	70	84	89	246	221	354	-1.0	-1.0	-1.0
52	79	78	76	-1	-1	-1	3.3	6.3	7.6
53	-1	-1	-1	592	546	694	-1.0	-1.0	-1.0
54	47	43	37	-1	-1	-1	11.0	10.6	4.7
55	42	-1	30	368	314	345	8.1	5.7	5.4
56	78	80	93	419	363	423	4.8	12.0	9.6

Table 7

The cost of college can be adversely affected by high attrition rates. Not only are educational investments made in individuals who do not complete, in the sense of receiving a degree, but intrayear attrition complicates staffing problems and leaves resources underutilized.

While the foregoing is a hypotheses which can be tested, this table shows the relationship between acceptance ratios (Total Accepted/ Total Applications) and intrayear attrition rates. The latter are measured in terms of declines from fall to spring in total number of credit hours earned. Indirectly, we wish to know whether high acceptance rates are associated with high attrition rates. Freshman enrollments are given as a means of evaluating impacts in terms of students enrolling.

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Table 8

Table 8 establishes the relationship between federal student aid programs and both total school enrollment and numbers of aid recipients. These figures are used to establish classifications of aid levels for analysis of resource allocations. Presumably, high levels of federal aid have provided means for internal resource allocations which might not otherwise have been made. Actual number of recipients and amounts of federal aid provided to each school are presented in Table 19.

Inasmuch as the allocation of federal aid is based on administrative decisions by each school, this table also provides an indication of how aid is allocated at the various institutions surveyed.

Table 7

Acceptance Ratio and Attrition

College #	Acceptance Ratio 67	68	69	Freshmen 67	68	69	Fall-to-Spring Attrition 67	68	69
1	67	74	57	-1	-1	-1	3.1	-1.0	-3.1
2	78	75	99	596	713	659	-1.0	-1.0	-1.0
3	-1	-1	-1	2177	2081	2229	-1.0	27.2	-1.0
4	-1	92	87	-1	-1	-1	-1.0	-1.0	-1.0
5	99	99	99	1539	1769	1790	7.3	11.8	11.7
6	57	58	70	323	329	379	-1.0	-19.2	10.8
7	-1	-1	-1	-1	-1	-1	-1.0	-1.0	-1.0
8	53	65	64	199	249	295	9.2	-11.8	-10.8
9	99	72	58	695	679	513	-1.0	-1.0	-1.0
10	-1	-1	-1	1343	1376	1387	-2.9	-31.3	-19.2
11	-1	-1	-1	488	516	614	2.7	17.0	-1.0
12	30	30	38	1335	1040	1142	-1.0	-1.0	-1.0
14	79	71	61	312	288	364	-1.0	6.4	11.4
15	-1	-1	-1	2098	1987	2548	-1.0	-1.0	-1.0
16	81	78	75	428	450	344	-1.0	-1.0	-1.0
18	-1	-1	-1	-1	-1	3137	-1.0	-1.0	-1.0
20	-1	-1	-1	1632	1329	1692	14.2	5.3	-1.0
21	95	92	97	807	814	702	10.9	5.7	1.7
22	69	-1	-1	1039	1134	1246	3.5	0.9	-71.6
24	63	70	53	1093	1118	860	0.2	-3.0	-2.5
25	67	64	62	514	499	627	1.8	0.0	-2.5
26	64	66	67	390	332	376	-1.0	-1.0	-1.0
28	87	88	92	1252	1247	1269	14.7	10.0	-1.0
29	46	46	50	413	384	443	4.5	0.6	11.1
30	50	57	61	151	170	205	10.5	3.8	1.5
31	51	54	44	425	434	481	6.2	2.2	-5.1
32	-1	-1	-1	388	486	372	8.8	7.1	-3.0
33	56	64	65	-1	-1	-1	14.6	18.7	3.8
34	62	73	74	172	211	273	5.9	8.8	5.3
35	43	40	-1	560	587	585	-1.0	-1.0	-1.0
37	45	46	45	628	741	735	8.2	8.1	21.6
38	-1	-1	29	-1	-1	-1	-1.0	-1.0	-1.0
39	56	63	64	-1	-1	-1	7.5	7.6	10.4
40	86	88	74	257	268	284	3.7	-1.0	2.3
41	68	81	79	267	172	198	-2.6	6.9	2.1
42	81	85	89	176	141	114	12.0	13.0	-12.7
43	70	87	80	204	255	171	3.9	-1.0	6.0
44	-1	-1	-1	1041	1051	1021	76.2	76.9	74.9
45	54	-1	-1	280	281	290	8.8	6.2	6.2
46	83	-1	89	237	238	211	10.8	6.3	1.1
47	93	-1	92	333	417	345	-1.0	2.8	17.3
48	-1	-1	-1	413	366	380	8.4	17.1	10.0
49	66	63	70	446	426	486	4.7	3.0	33.6
50	93	81	62	642	721	587	-1.0	15.6	18.9
51	70	84	89	246	221	354	-1.0	-1.0	-1.0
52	79	78	76	-1	-1	-1	3.3	6.3	7.6
53	-1	-1	-1	592	546	694	-1.0	-1.0	-1.0
54	47	43	37	-1	-1	-1	11.0	10.6	4.7
55	42	-1	30	368	314	345	8.1	5.2	5.4
56	78	80	93	419	363	423	4.8	12.0	4.6

Table 8

Federal Student Aid (EOG, NDSL, CWS) Per Student Enrolled and Per Recipient (dollars)

College	Per Enrollment			Per Recipient		
#	67	68	69	67	68	69
1	131	134	121	514	546	562
2	101	181	186	315	389	379
3	91	97	85	581	450	428
4	31	26	26	421	444	475
5	55	54	51	295	293	282
6	46	64	57	337	513	468
7	74	36	20	391	165	110
8	21	19	16	264	259	191
9	150	145	128	284	267	298
10	38	34	48	597	486	632
11	102	123	104	365	396	352
12	23	20	15	206	203	227
14	103	125	118	338	317	357
15	110	83	57	409	354	373
16	254	230	358	217	226	308
18	172	121	122	768	504	660
20	172	158	161	317	341	385
21	183	176	185	425	400	463
22	56	54	53	488	453	452
24	323	452	429	326	419	499
25	140	157	144	478	496	509
26	146	138	118	559	585	603
28	97	97	98	591	595	626
29	291	243	310	382	316	359
30	44	73	83	466	453	475
31	169	195	202	482	478	468
32	92	77	104	627	726	553
33	128	114	113	606	572	608
34	39	38	60	520	470	759
35	242	254	237	529	530	567
37	188	186	154	391	381	386
38	-1	-1	9	-1	-1	68
39	201	185	249	617	564	608
40	90	103	101	531	548	549
41	238	159	200	850	576	709
42	16	20	38	779	595	624
43	129	127	136	413	461	584
44	104	122	101	483	473	440
45	161	179	193	510	558	557
46	174	188	189	629	613	623
47	182	198	212	464	487	417
48	150	149	162	513	481	503
49	151	164	133	614	636	629
50	116	108	96	583	599	651
51	176	183	178	627	606	627
52	248	240	324	497	538	609
53	222	204	181	571	517	612
54	-1	125	129	469	487	493
55	36	69	79	1096	1399	1709
56	167	194	183	304	424	323

Table 9

The importance of student aid and, specifically, federal student aid, varies widely from college to college. Table 9 attempts to relate total student aid and total federal student aid to total expenditures and revenues.

The first group of columns present total student aid expenditures, as reported in the operating budget of a school, as a fraction of total revenues. The second group of columns present a similar proportion for federal student aid. In a number of cases federal aid is a larger fraction of revenues than the supposed combination of all aid provided by the school. This difference is reflected in the third set of columns where federal student aid is presented as proportion of total student aid. State accounting procedures separate federal student aid funds into budget categories which are not included in school budgets for statistical purposes by CRA. Also, many independent schools maintain fund accounts separate from the normal budgeting material especially for federal student aid accounts. For this reason, as well as the somewhat chaotic nature of record-keeping on student aid programs at several institutions, these data are highly questionable.

Federal aid as a percent of total revenue is the most significant of all data presented in Table 9.

Table 10

Much analysis of higher education is based on credit hours produced and cost per credit hour. Table 10 presents two measures of cost as well as a summary of total credit hours produced between 1967 and 1969.

The first measures total cost per credit hour based on total current operating expenditures. The second measures instruction cost per credit hour based on total expenditures for instruction as reported in the institution's budget. The relative effect of the rise in total costs and instruction cost per credit hour can best be seen in the data for school #'s 11, 21, 25 and 45 where credit hours varied only slightly from year to year.

Table 9

Student Aid/Federal Aid Program Analysis

College	Total Stu Aid Pct of Rev			Federal Stu Aid Pct of Rev			Federal Stu Aid Pct of All Aid		
#	67	68	69	67	68	69	67	68	69
1	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
2	7.6	7.7	8.1	4.5	8.4	8.5	58	[illegible]	4
3	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
5	2.4	2.1	2.3	3.4	3.5	3.5	43	66	[illegible]
6	0.0	0.0	0.0	2.8	3.9	3.3	-1	-1	-1
7	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
8	1.7	1.8	3.2	1.5	1.3	1.1	88	74	[illegible]
9	8.9	8.7	5.2	9.9	8.2	6.9	111	93	134
10	1.6	4.3	3.9	4.2	2.8	3.7	51	50	[illegible]
11	5.5	2.8	3.2	5.1	5.7	4.7	94	[illegible]	[illegible]
12	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
14	2.2	2.2	1.8	4.4	4.9	4.2	99	[illegible]	[illegible]
15	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
16	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
18	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
20	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
21	17.2	18.2	9.8	9.8	8.5	8.8	57	47	90
22	4.1	5.0	4.9	2.9	2.4	2.1	70	47	[illegible]
24	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
25	7.3	7.0	7.1	6.7	7.0	5.6	92	90	78
26	9.1	8.1	7.3	5.6	4.7	4.1	61	58	55
28	8.2	9.9	10.2	3.8	3.4	3.0	46	34	[illegible]
29	4.0	3.7	4.4	5.2	4.2	5.2	27	13	18
30	9.8	9.0	9.5	1.3	1.9	2.2	13	21	[illegible]
31	19.8	20.3	25.0	3.2	3.7	3.6	17	18	15
32	6.7	7.4	8.1	1.7	1.4	1.7	25	19	[illegible]
33	0.3	0.6	2.3	7.0	6.2	4.6	97	60	11
34	3.5	3.8	4.4	1.1	1.0	1.4	31	27	[illegible]
35	8.5	9.2	9.0	4.2	4.0	3.5	50	44	39
37	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
38	9.7	9.4	0.4	-1.0	-1.0	0.1	-1	-1	[illegible]
39	6.6	8.4	10.3	9.3	6.4	7.2	30	75	[illegible]
40	3.0	3.8	6.4	2.8	3.1	3.3	92	81	[illegible]
41	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
42	5.2	4.8	5.2	0.8	0.8	1.1	15	17	21
43	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
44	9.6	10.5	10.4	6.1	6.3	4.4	63	[illegible]	[illegible]
45	9.3	9.9	9.6	7.7	7.9	8.0	42	[illegible]	[illegible]
46	7.5	9.1	9.5	5.5	5.7	5.2	73	57	[illegible]
47	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
48	11.5	12.9	14.6	8.2	5.9	6.1	70	45	[illegible]
49	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
50	8.6	7.5	8.3	3.6	3.2	2.6	43	42	32
51	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
52	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
53	7.4	4.8	4.5	8.3	7.6	6.0	111	159	134
54	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1
55	8.5	6.6	7.9	0.7	1.4	1.4	12	21	18
56	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1	-1	-1

Table 10

Credit Hours Earned & Credit Hours Cost

#	Credit Hours (1,000) 67	68	69	Cost per Credit Hr. ($) 67	68	69	Instruction Cost per Credit Hr. ($) 67	68	69
1	25	-1	144	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
2	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
3	-1	240	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
4	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
5	103	125	128	41.50	39.00	38.00	11.75	11.50	12.75
6	-1	19	23	-1.00	82.25	80.25	-1.00	37.50	34.00
7	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
8	18	19	27	47.25	50.25	47.50	29.50	31.75	29.25
9	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
10	[illegible]	68	62	45.50	33.00	45.75	12.75	13.00	19.[illegible]
11	31	31	-1	90.75	98.00	-1.00	30.50	38.[illegible]	-1.00
12	[illegible]	160	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
14	18	19	19	72.75	77.00	97.75	31.25	31.75	34.75
15	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
16	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
18	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
20	119	117	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
21	75	75	73	38.43	45.17	47.91	9.06	11.93	12.90
22	68	102	156	55.25	59.75	46.75	21.75	23.75	18.75
24	107	97	95	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
25	41	40	41	83.50	94.75	115.25	19.50	23.75	27.25
26	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
28	132	123	-1	73.50	84.25	-1.00	20.50	23.50	-1.00
29	43	35	41	177.25	199.25	205.25	34.75	39.00	40.75
30	6	5	5	314.75	368.25	335.50	86.00	101.50	111.25
31	43	54	57	163.16	164.30	181.56	28.60	31.86	33.04
32	62	65	61	97.75	111.00	135.25	18.75	23.50	24.00
33	107	153	145	30.75	40.75	49.25	13.50	17.50	20.25
34	15	16	18	123.50	141.75	140.50	34.25	34.75	39.75
35	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
36	44	46	45	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
38	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
39	32	30	27	63.25	82.75	102.25	19.75	20.50	25.25
40	20	28	29	38.50	89.00	81.50	18.50	21.75	22.00
41	34	30	24	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
42	22	18	13	50.00	71.75	112.00	13.75	21.25	29.75
43	35	-1	23	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
44	29	32	32	191.00	199.00	231.75	59.00	60.25	67.75
45	28	28	26	63.50	73.25	74.50	16.00	17.75	17.25
46	27	24	27	97.50	100.25	113.25	24.50	28.25	33.75
47	-1	12	11	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
48	26	37	23	115.25	97.50	162.00	30.75	23.75	30.25
49	42	43	25	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
50	45	73	63	102.83	80.96	103.55	22.73	17.98	24.10
51	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
52	52	58	55	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
53	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
54	113	128	132	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
55	43	45	47	129.25	134.50	146.75	34.50	35.50	38.00
56	31	37	34	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00

Table 11

Enrollment may be measured in several ways: headcount at registration, full-time equivalent based on credit hours, full-time equivalent based on contact hours, headcount by enrollee whether attending or not, and so on. For the purposes of this study CRA has considered only full-time day undergraduate (and graduates where separate schools are not maintained) in its computation of enrollment. All part-time students including night students and students in special categories are not included in total enrollment figures. The first three columns in Table 11 present the numbers arrived at by CRA computation. The firt column of "Full-time Day" includes all full-time undergraduates and graduates taken directly from the accumulated enrollment data. The second column lists, where available, the number of graduates included in the "Full-time Day" count. The third column presents the number of students at a school considered by CRA to be in a "Special" category. These last two columns are also taken directly from enrollment data.

The second set of columns provide an alternative measure of enrollment based on credit hours earned. "Required Annual Hours" in the first column under FTE refer to the minimum required number of credits to be earned by a student to maintain full-time standing at an institution in 1969. The credit value of each course offered between 1967 and 1969 was included on class lists developed for the study as well as *total enrollment in each class*. By summing the total number of credits earned for every class (number of students in a course multiplied by the credit value of the course for every class) and dividing by the minimum required number of credit hours, a full-time equivalent enrollment figure is obtained. These are listed in the second column under "FTE". The third column represents the ratio of "Full-time Day" students to Full-time Equivalent students.

Because special students have not been included in full-time enrollment count, we would expect the equivalent student attendance figure to be lower than the full-time day figure, the difference being accounted for in part by the uncounted special students.

The difference at most schools, however, is not well explained by reference to this category of student (e.g. # 8, # 21, # 42). An alternative explanation for a low ratio would be that a number of students are completing fewer than the minimum required number of credits each year. For schools whose FTE enrollment ratio is greater than 1.00, we would suspect that a number of students are taking more than the required number of credits.

Table 11

Alternative Enrollment Measures: 1969

	CRA			FTE		
#	Full-time Day Direct	Graduate Direct	Part-time Direct	Requ'd Annual Hours	Equiv. Student Attendance	Ratio To Reported FT Students
1	4496	-1	421	47	3075	0.68
2	2228	175	19	45	-1	-1.00
3	7277	204	610	48	-1	-1.00
4	1462	-1	1272	30	-1	-1.00
5	3795	20	534	34	3777	0.99
6	1112	1	32	32	744	0.66
7	6267	-1	172	50	-1	-1.00
8	937	0	20	32	871	0.92
9	2266	0	48	30	-1	-1.00
10	3087	47	65	31	2022	0.65
11	1816	17	20	32	-1	-1.00
12	7627	3004	-1	32	5152	0.68
14	690	6	225	30	648	0.93
15	6588	0	4074	48	-1	-1.00
16	1129	0	97	31	-1	-1.00
18	9260	1113	774	47	-1	-1.00
20	3940	407	383	34	-1	-1.00
21	1714	0	47	46	1596	0.93
22	3448	39	130	32	4891	1.41
24	3026	195	36	30	3175	1.04
25	2643	25	204	31	1344	0.50
26	1902	843	1417	48	-1	-1.00
28	4272	260	427	31	-1	-1.00
29	1392	7	17	30	1377	0.98
30	619	0	0	9	642	1.04
31	1888	294	367	30	1901	1.00
32	1450	0	4	36	1715	1.18
33	4670	0	1070	32	4539	.97
34	673	0	7	31	610	0.90
35	2266	34	89	28	-1	-1.00
37	2793	349	652	32	1447	0.51
38	550	0	2	8	-1	-1.00
39	820	0	167	32	846	1.03
40	851	0	83	32	907	1.06
41	749	17	81	32	773	1.03
42	475	0	6	32	430	0.90
43	1522	700	-1	31	952	0.62
44	3539	39	23	28	1169	0.33
45	859	0	81	31	846	0.98
46	864	19	93	30	931	1.07
47	1253	0	111	30	378	0.30
48	1511	328	970	31	760	0.50
49	3582	630	-1	32	811	0.22
50	1895	20	116	32	1970	1.03
51	904	0	0	32	-1	-1.00
52	2650	415	1628	32	1745	0.65
53	2392	70	292	31	-1	-1.00
54	-1	-1	1541	30	4429	-1.00
55	1303	0	35	32	1496	1.14
56	1058	0	359	32	1058	1.00

Table 12

Faculty costs are directly affected by the ratio of tenured to non-tenured faculty. The general quality of instruction may also be affected by this ratio. Statistics on this aspect of the fifty institutions are provided in Table 12. Any faculty member at or above the level of associate professor is considered to be tenured for the purposes of this analysis.

Ratios generally do not vary singificantly between years for the majority of institutions. What variations do occur are primarily the result of changes in non-tenured faculty rather than in tenured faculty.

Table 13

A simple profit or deficit at the end of a budget cycle is not necessarily an adequate measure of the financial health of an institution. It is possible to end the year with a slight profit and be in worse relative shape than an institution showing a deficit, depending on the nature of the individual expenditure and revenue items for the year. CRA considers only current operating expenditures, i.e. current operating costs, in its determination of total annual cost. Transfers, additions to endowments or capital reserves, depreciation, etc., are not included. All revenues, on the other hand, are included in the total revenue figure developed, as it is difficult, if not impossible, to determine which revenues will be used only to meet current operating expenses. Based on this methodology, several indicators of financial strength were considered.

The first three columns present the difference between total revenues and total expenditures as defined above. The difference, or "gap", is the margin by which schools meet current operating costs with total revenue. School # 2, for instance, shows a positive margin of $100.1 thousand in 1967, a negative margin of $79.8 thousand in 1968, and no margin in 1969. Comparing actual gaps among schools is not totally satisfactory or accurate as the size of the institution may considerably affect the significance of the gap. To suppress the effect which size has on the statistic, the gap is divided by the total full-time enrollment of the institution considered. The second set of 3 columns summarizes the "gap per student" for 1967, 1968 and 1969.

An alternative way of using this same principle is to consider the ratio of revenues to expenditures. The last three columns present the revenue/expenditure ratios for 32 institutions in 1967, 1968 and 1969. This statistic has proved to be the most practical in statistical analysis of the financial health of an institution because it tends to be more analogous to the normal distribution than other measures.

Table 12

Ratio of Faculty in Untenured Ranks

-----------Ratio: Tenured to Non-tenured-------------

#	**1967**	**1968**	**1969**
1	1.07	0.90	0.86
2	0.63	0.72	0.68
3	0.81	0.71	-1.00
4	-1.00	-1.00	-1.00
5	0.57	0.51	0.59
6	0.76	1.23	1.00
7	0.36	0.35	0.36
8	0.70	0.56	0.43
9	-1.00	-1.00	-1.00
10	0.21	0.20	0.22
11	0.49	0.51	0.72
12	0.75	0.64	0.83
14	1.10	0.87	0.81
15	0.60	0.58	0.69
16	0.36	0.59	0.40
18	-1.00	-1.00	1.63
20	0.73	0.56	0.94
21	0.37	0.44	0.45
22	0.59	0.51	0.61
24	0.32	0.39	0.44
25	0.53	0.55	0.56
26	-1.00	0.79	0.80
28	0.89	0.96	0.98
29	0.68	0.66	0.76
30	0.77	0.53	0.64
31	1.15	1.32	2.19
32	0.87	0.96	1.04
33	0.68	0.58	0.77
34	0.89	1.09	0.87
35	-1.00	-1.00	-1.00
37	-1.00	0.41	0.45
38	-1.00	-1.00	-1.00
39	0.51	0.50	0.44
40	0.57	0.46	0.65
41	0.52	0.26	0.40
42	0.48	0.46	0.34
43	-1.00	-1.00	-1.00
44	1.78	0.82	0.76
45	0.75	0.77	1.58
46	0.38	0.50	0.46
47	0.95	0.65	0.69
48	0.32	0.20	0.28
49	0.61	0.95	-1.00
50	1.03	0.86	1.01
51	1.29	1.05	1.10
52	0.32	0.41	0.51
53	0.47	0.48	0.46
54	0.85	0.76	0.78
55	0.75	0.60	0.61
56	0.24	0.26	0.28

Table 13

Alternative Measures of Financial Health

#	Revenues Less Operating Expense ($000) 1967	1968	1969	Difference per Student 1967	1968	1969	Ratio: Revenues to Expenditures 1967	1968	1969
1	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
2	100.1	-79.8	0.0	55	-38	0	1.02	0.98	.99
3	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
4	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
5	313.5	547.9	519.6	107	151	136	1.07	1.11	1.10
6	2.9	0.0	0.7	3	0	0	1.00	1.00	1.00
7	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
8	-1.9	3.6	0.0	-2	4	0	0.99	1.00	1.00
9	-19.3	94.2	-419.8	-8	38	-185	0.99	1.02	0.90
10	234.2	1110.6	1137.0	95	389	368	1.12	1.48	1.39
11	380.7	402.8	363.8	232	247	200	1.13	1.13	1.09
12	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
14	8.5	70.4	24.5	16	121	35	1.00	1.05	1.01
15	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
16	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
18	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
20	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
21	191.5	249.1	91.4	116	141	53	1.07	1.07	1.03
22	286.5	743.4	1100.6	106	238	319	1.05	1.12	1.15
24	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
25	524.9	706.8	404.1	397	344	197	1.23	1.18	1.08
26	67.6	-43.1	-20.9	48	-24	-10	1.01	0.99	.99
28	786.3	768.2	990.3	188	179	231	1.08	1.06	1.07
29	-41.2	88.0	-361.4	-29	63	-261	0.99	1.01	.95
30	64.6	167.0	-10.8	138	276	-17	1.04	1.07	0.99
31	300.7	176.4	11.4	191	102	6	1.04	1.02	1.00
32	45.8	163.5	12.2	36	112	8	1.00	1.02	1.01
33	1525.3	1775.1	2637.0	488	399	619	1.37	1.28	1.38
34	125.8	2.4	24.7	210	3	36	1.06	1.00	1.01
35	608.5	458.8	1167.1	287	452	529	1.05	1.08	1.09
37	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
38	1.8	9.7	-44.1	0	4	-80	1.00	1.00	.98
39	24.6	126.8	42.5	25	135	51	1.01	1.04	1.01
40	292.4	233.0	222.3	328	278	261	1.11	1.09	1.09
41	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
42	29.2	-55.6	10.3	47	-99	21	1.02	0.95	1.00
43	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
44	131.8	345.5	325.7	38	97	92	1.02	1.05	1.04
45	177.7	80.1	97.2	200	92	113	1.10	1.04	1.04
46	223.9	269.3	-41.2	237	299	-47	1.08	1.09	0.98
47	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
48	-32.7	219.3	150.9	-19	140	99	0.98	1.05	1.03
49	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
50	22.9	201.7	257.4	14	111	189	1.00	1.03	1.05
51	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
52	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
53	506.3	13.6	724.9	246	6	303	1.10	.99	1.11
54	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00
55	235.4	-19.1	-28.2	182	-14	-21	1.04	0.99	0.99
56	-1.0	-1.0	-1.0	-1	-1	-1	-1.00	-1.00	-1.00

Table 14

Total change in number of faculty and in average teaching hours are compared in Table 14. Statistics on both data items are presented as an index of change during the period 1967 to 1969 at each institution. Faculty numbers have increased at most institutions while average teaching hours have tended to fall almost in proportion to the increase in number of faculty. These data are useful when considering other cost-generating characteristics such as changes in faculty salaries, enrollment, class offerings, class size, etc., as the data provide a key to determining levels of "productivity" (as measured by number of hours of teaching [or of education] per dollar of expenditure).

Table 15

Instruction costs are susceptible to several different measures. CRA methodology computes classroom teaching costs from salaries of instructors in proportion to the actual amount of time spent in teaching. Thus, compensation for administrative duties and other non-teaching activities are excluded from consideration in overall instruction cost determinations. A more accurate profile of actual teaching costs is presented and it is of interest to compare costs derived in this fashion with costs derived from budgeted "Instruction" expenses.

The first group of columns in Table 15 present classroom teaching costs per student as defined by CRA. The second set of columns present classroom teaching costs as a ratio of total instruction costs recorded by the institution. In almost every instance, instruction costs are higher than classroom teaching costs as such expenditure items as supplies and travel are excluded from classroom cost figures. A large gap between the two cost figures suggests that significant additional costs other than teaching are being incurred. School #39, #40 and # 42 have a smaller instruction cost figure than classroom teaching cost figure as a number of faculty receive no real compensation for their services (equivalent faculty salaries are computed for these instructors for cost comparison purposes with other schools). Classroom teaching costs are higher then instruction costs at # 10, # 50, and # 55 due to fringe benefits which were excluded from budget figures for instruction but included in figures for classroom Instruction costs at #5 are higher due to a budget error which excluded salaries of certain administrators who also taught and who were included included as part-time faculty.

Classroom teaching costs are compared with total expenditures as a ratio in the third set of columns. The most efficient schools according to CRA methodology are those for which classroom teaching costs are a greater fraction of total expenditures.

Table 14

Supplementary Institution Characteristics

#	Faculty Index 1967-69	Teaching Hours Index 1967-69
1	111	115
2	105	-1
3	-1	-1
4	-1	-1
5	105	98
6	107	183
7	111	-1
8	116	95
9	-1	-1
10	113	87
11	114	-1
12	120	35
14	113	85
15	121	-1
16	-1	-1
18	-1	-1
20	111	-1
21	112	110
22	116	143
24	124	126
25	122	111
26	-1	-1
28	118	-1
29	111	104
30	114	89
31	126	-1
32	113	98
33	111	93
34	115	98
35	-1	-1
37	-1	-1
38	119	-1
39	104	76
40	124	111
41	120	88
42	180	95
43	-1	-1
44	116	87
45	108	163
46	-1	81
47	109	123
48	125	98
49	-1	-1
50	117	77
51	102	-1
52	107	64
53	126	-1
54	114	115
55	115	102
56	120	93

Table 15

Classroom Teaching Costs (CTC)

	($) Cost per Student			CTC/Instruction Cost			CTC/Total Expenditures		
#	1967	1968	1969	1967	1968	1969	1967	1968	1969
1	770	760	888	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
2	595	623	628	0.80	0.80	0.81	0.27	0.28	0.28
3	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
4	874	902	957	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
5	523	481	527	1.23	1.20	1.22	0.35	0.35	0.40
6	631	572	507	0.79	0.76	0.69	0.39	0.34	0.29
7	471	491	544	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
8	515	499	568	0.60	0.58	0.64	0.37	0.36	0.40
9	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
10	234	284	359	1.05	0.89	0.91	0.29	0.35	0.38
11	476	491	418	0.82	0.66	0.54	0.27	0.25	0.20
12	386	459	414	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
14	891	904	850	0.89	0.90	0.88	0.38	0.37	0.30
15	556	578	640	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
16	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
18	-1	-1	530	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
20	512	522	598	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
21	373	390	445	.90	.76	.80	.21	.20	.21
22	647	667	761	0.90	0.85	0.88	0.35	0.34	0.35
24	824	788	871	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
25	336	367	395	0.85	0.77	0.70	0.20	0.19	0.16
26	-1	419	449	-1.00	0.71	0.75	-1.00	0.14	0.15
28	543	712	729	0.82	0.96	0.91	0.23	0.27	0.24
29	644	645	862	0.58	0.59	0.71	0.11	0.11	0.14
30	766	871	993	0.89	0.90	0.95	0.24	0.24	0.26
31	688	436	851	.79	.94	.85	.13	.18	.15
32	946	918	1065	0.85	0.81	0.84	0.17	0.17	0.19
33	423	436	525	0.73	0.72	0.75	0.32	0.31	0.31
34	889	978	1047	0.96	0.97	0.93	0.26	0.26	0.26
35	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
37	-1	576	571	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
38	-1	-1	1335	-1.00	-1.00	.86	-1.00	-1.00	.28
39	577	731	1000	0.85	1.07	1.19	0.27	0.26	0.29
40	603	794	681	0.99	1.06	0.90	0.20	0.26	0.24
41	620	735	919	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
42	500	730	936	1.00	1.01	1.08	0.27	0.30	0.28
43	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
44	446	475	588	0.87	0.85	0.93	0.26	0.26	0.27
45	443	565	473	0.93	1.08	0.88	0.23	0.26	0.20
46	-1	-1	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
47	592	793	883	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
48	233	320	262	0.48	0.56	0.42	0.12	0.13	0.10
49	255	278	-1	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
50	704	729	843	1.01	1.01	1.05	.22	.22	.24
51	1020	1171	1171	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
52	238	234	293	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
53	503	681	689	.68	.80	.77	.20	.25	.25
54	-1	996	996	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
55	1274	1371	1472	1.05	1.08	1.04	0.28	0.28	0.27
56	383	419	451	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00

Table 16

Institution statistics often vary according to the particular source of the data and to the lack of any clear commonly accepted definitions of data items even within an institution. Table 16 compares statistics on full-time freshman enrollment as provided generally by the Registrar's Office and the Admissions Office separately. Group # 1 represent data on first-time entering freshmen from admissions statistics while group # 2 represent enrollment statistics taken from general school enrollment data. The third set of columns present the number of freshmen accepted as a percent of completed applications.

Table 17

Admissions statistics of the type presented in Table 17 provide useful indicators both of the overall strength of an institution and of the success of plans and policies for growth. Under increasing financial pressure a private institution may become more dependent on its students as a source of revenue. The first two columns present the total number of completed applications for 1968 and 1969 as an index of the number of applications in 1967. If a school is to grow and at the same time to maintain the average quality of student it enrolls, an ever-widening pool of applicants must be found. Only 11 schools of all those listed in Table 27 have experienced a continued growth in the number of applications, while 21 have experienced an actual decline. Of the 21, 5 have had declining applications for all years considered.

The second pair of columns present the total number of students accepted in 1968 and 1969 as an index of the total number accepted in 1967. The number of formal acceptances made have generally risen faster than the number of applications for the years considered, indicating that more students are being accepted among those who complete an application. The number of students actually entering has not risen as rapidly as the number of acceptances, suggesting slightly greater competition among schools for more limited numbers of students. The last pair of columns present the number of first-time entering freshmen in 1968 and 1969 as an index of the number enrolling in 1967.

Table 16

Freshman Enrollment Data

#	Freshman Enrollment #1 1967	1968	1969	Freshman Enrollment #2 1967	1968	1969	Acceptance Ratio - Pct. 1967	1968	1969
1	537	623	651	-1	-1	-1	67	-1	57
2	495	519	542	596	713	657	78	75	10
3	-1	-1	-1	2177	2081	2227	-1	-1	-1
4	-1	791	810	-1	-1	-1	-1	92	87
5	1713	2076	2019	1539	1769	1790	99	99	9
6	298	313	355	323	329	379	57	58	7
7	-1	-1	-1	-1	-1	-1	-1	-1	-1
8	-1	247	319	199	249	295	53	65	54
9	637	624	452	695	679	513	100	72	5
10	-1	-1	-1	1343	1376	1387	-1	-1	-1
11	488	516	614	488	516	614	-1	-1	-1
12	1040	1142	1484	1335	1040	1142	30	30	3
14	295	270	195	312	288	364	79	71	61
15	2098	1987	2548	2098	1987	2548	-1	-1	-1
16	389	450	389	428	450	344	81	78	7
18	2048	1895	2000	-1	-1	3137	-1	-1	-1
20	1632	1298	1692	1632	1329	1692	-1	-1	-1
21	633	556	501	807	814	702	95	92	97
22	517	994	1095	1039	1134	1246	69	-1	-1
24	1083	1100	855	1093	1118	860	63	90	5
25	530	499	641	514	499	627	67	64	62
26	387	330	370	390	332	376	64	66	67
28	1434	1597	1844	1252	1247	1269	87	88	92
29	392	366	426	413	384	443	46	46	5
30	149	168	206	151	170	205	50	57	61
31	407	432	468	425	434	481	51	54	44
32	401	488	368	388	486	372	-1	-1	-1
33	584	1277	1018	-1	-1	-1	56	64	65
34	153	187	246	172	211	273	62	73	7
35	674	662	722	560	587	585	43	40	-1
37	594	741	735	628	741	735	45	46	45
38	-1	-1	215	-1	-1	-1	-1	-1	29
39	289	227	198	-1	-1	-1	56	63	64
40	249	256	260	257	268	284	86	88	74
41	265	174	200	267	172	198	68	81	70
42	148	141	114	176	141	114	81	85	89
43	204	255	238	204	255	171	70	87	80
44	1041	1051	1021	1041	1051	1021	-1	-1	-1
45	280	281	290	280	281	290	54	-1	-1
46	238	-1	212	237	239	211	83	-1	89
47	401	417	401	333	417	345	93	-1	92
48	436	389	409	413	366	380	-1	-1	-1
49	405	417	437	446	426	486	66	63	70
50	518	578	544	642	721	587	93	81	62
51	231	209	341	246	221	354	70	84	85
52	468	447	401	-1	-1	-1	79	78	76
53	592	546	694	592	546	694	-1	-1	-1
54	904	902	921	-1	-1	-1	47	43	37
55	372	303	330	368	314	345	42	-1	3
56	452	421	446	419	368	423	78	80	93

Table 17

Selected Admissions Statistics

	Applications Index 1967=100		Acceptance Index 1967=100		First-Time Entering Frosh Index 1967=100	
1	102	147	113	126	116	121
2	112	132	108	170	120	111
3	-1	-1	-1	-1	98	105
4	-1	-1	-1	-1	-1	-1
5	114	111	114	111	115	116
6	117	110	118	136	102	117
7	-1	-1	-1	-1	-1	-1
8	104	122	127	148	125	148
9	110	108	80	63	98	74
10	-1	-1	-1	-1	102	103
11	-1	-1	-1	-1	106	126
12	76	103	100	133	78	86
14	106	92	95	71	92	117
15	-1	-1	-1	-1	95	121
16	111	98	106	92	105	80
18	-1	-1	-1	-1	93	98
20	-1	-1	-1	-1	81	104
21	98	92	95	95	101	87
22	126	137	-1	-1	109	120
24	98	108	108	92	102	79
25	101	123	96	116	97	122
26	96	104	98	109	85	96
28	87	91	88	96	100	101
29	93	99	94	107	93	107
30	107	122	122	151	113	136
31	105	155	112	134	102	113
32	-1	-1	-1	-1	125	96
33	107	107	122	124	130	103
34	107	111	127	134	123	159
35	111	-1	104	-1	105	104
37	100	113	103	115	118	117
38	104	156	-1	-1	-1	-1
39	108	92	122	106	79	69
40	84	103	85	89	104	111
41	63	59	76	69	64	74
42	91	62	95	73	80	65
43	106	127	132	146	125	84
44	-1	-1	-1	-1	101	98
45	-1	-1	-1	-1	100	104
46	-1	75	-1	81	100	89
47	-1	-1	-1	-1	125	104
48	-1	-1	-1	-1	89	92
49	109	99	105	107	96	109
50	136	164	119	112	112	91
51	81	115	97	145	90	144
52	107	100	105	98	96	86
53	-1	-1	-1	-1	92	117
54	47	146	106	115	100	102
55	-1	111	-1	81	85	94
56	93	110	94	-1	88	100

Table 18

Enrollment of full-time undergraduates, graduates and special students are recorded separately in Table 18 and presented for the three school years 1967, 1968 and 1969. Previous enrollment statistics summarized full-time undergraduate and graduate students while excluding from the total count students in the "special" category. For our purposes evening students from other institutions, and students who are not registered for full-time credit standing at the undergraduate or graduate level are considered as "special". Where precise data were not available on the differentiation of special students from all others, no statistics appear. When a precise count of full-time graduate students was not provided, the totals for full-time undergraduates were not listed, though the grand total of graduate and undergraduate students do appear in other tables.

Table 19

A summary of Federal student aid programs (College Work/Study, Educational Opportunity Grants, and National Defense Student Loans) at each of the fifty colleges is presented in Table 19. The first set of three columns provides the total number of new and renewal awards of federal aid made between 1967 and 1969. The second set of three columns includes the total amount of federal aid awarded, again for new awards and renewals. The schools' contribution to each federal program and the allocation for administrative costs are not included. Indexes for the total number of awards and the total dollar amount awarded are set forth in the last four columns and provide an illustration of the relative characteristics, magnitude and direction of change in federal aid programs at each of the institutions.

Table 18

Enrollment by Level

Full-time Undergraduate [FT-U], Graduate [G], Special (part-time) [Sp]

	1967			1968			1969		
#	**FT-U**	**G**	**Sp**	**FT-U**	**G**	**Sp**	**FT-U**	**G**	**Sp**
1	-1	-1	297	-1	-1	295	-1	-1	421
2	1702	91	14	1959	129	14	2053	175	19
3	5583	117	391	6537	121	523	7073	204	10
4	-1	-1	1093	-1	-1	1273	-1	-1	1[illegible]72
5	2912	2	408	3588	20	449	3775	20	434
6	669	2	19	999	3	27	1124	1	32
7	-1	-1	122	-1	-1	139	-1	-1	172
8	625	0	23	695	0	38	917	0	20
9	2332	0	76	2429	0	68	2266	0	48
10	2442	0	53	2952	30	66	3073	47	65
11	1610	24	18	1615	13	21	1805	17	20
12	4416	1577	9107	4396	2218	-1	4723	3004	-1
14	528	3	191	610	6	240	684	6	225
15	4721	0	4727	5450	0	5100	6585	0	4[illegible]74
16	1324	0	30	1203	0	38	1147	0	67
18	8456	668	-1	9192	781	-1	9260	1113	774
20	3604	408	235	3554	371	309	3766	407	383
21	1648	0	144	1761	0	54	1714	0	47
22	2683	15	327	3091	24	326	3409	39	130
24	2791	216	44	2999	191	48	2855	195	36
25	1663	16	190	1852	30	169	2018	25	204
26	1679	743	1784	1022	773	1722	1059	843	1417
28	4164	270	378	4271	273	400	4254	260	427
29	1481	7	15	1423	3	17	1413	7	17
30	610	0	0	605	0	0	619	0	0
31	1328	250	153	1498	266	287	1615	294	367
32	1373	0	3	1261	0	0	1450	0	4
33	4925	26	1007	4615	0	1000	4670	0	1070
34	603	0	7	637	0	8	680	0	7
35	2679	44	71	2083	36	60	2172	34	89
37	2202	36	671	2368	47	682	2444	349	652
38	-1	-1	-1	-1	-1	-1	550	0	2
39	964	0	272	935	0	285	820	0	1[illegible]7
40	889	0	52	837	0	49	851	0	93
41	990	22	63	891	19	10	732	17	41
42	620	0	27	555	0	6	469	0	6
43	625	718	1528	872	714	1811	822	700	-1
44	3358	25	30	3500	28	47	3501	38	33
45	886	0	67	876	0	71	866	0	81
46	-1	11	29	-1	-1	85	847	19	93
47	1304	0	141	1333	0	92	1263	0	111
48	1364	321	1381	1268	331	957	1183	328	970
49	2965	656	0	2965	653	0	2952	630	0
50	1579	28	29	1805	15	102	1918	20	116
51	834	0	0	791	0	0	906	0	0
52	2122	381	1369	2513	388	1641	2235	415	1678
53	2635	27	302	2060	40	300	2346	70	[illegible]
54	-1	-1	-1	-1	-1	1236	-1	-1	15[illegible]1
55	1300	0	27	1296	0	46	1303	0	45
56	992	0	326	1029	0	295	1087	0	359

Table 19

Federal Student Aid

#	Number of Beneficiaries 1967	1968	1969	Total Amount Awarded ($) 1967	1968	1969	Beneficiaries Index 1967 = 100 1968	1969	Total $ Index 1967 = 100 1968	1969
1	913	1045	1049	469521	570903	589662	114	114	121	125
2	572	970	1094	180378	377210	415091	169	191	209	230
3	958	1439	1451	557004	648168	620631	150	151	116	111
4	90	86	81	37915	38193	38450	95	90	100	101
5	544	659	690	160275	193101	194689	121	126	120	121
6	117	124	136	39418	63625	63710	105	116	161	161
7	1407	1771	1523	551550	292651	167342	125	108	53	30
8	51	54	79	13449	14000	15066	105	154	104	112
9	**1228**	**1323**	**972**	**349348**	**353215**	**289405**	**108**	**79**	**101**	**83**
10	154	201	236	91874	97586	149096	130	153	106	162
11	463	504	539	167281	199812	189688	108	116	119	113
12	670	638	499	138271	129479	113170	95	74	93	81
14	162	228	229	54824	72213	81645	140	141	131	148
15	1273	1280	1001	520486	453676	373840	100	78	87	71
16	1503	1320	1312	325907	298312	404098	87	87	91	123
18	2046	2404	1923	1572627	1211381	1268739	117	93	77	80
20	2103	1799	1644	667129	613703	633111	85	78	91	94
21	711	776	685	302324	310398	316876	109	96	102	104
22	311	368	402	151650	166702	181861	118	129	109	119
24	2973	3391	2605	969079	1419222	1298703	114	87	146	134
25	610	648	576	291565	321550	293225	106	94	110	100
26	476	422	371	266020	247020	223607	88	77	92	84
28	683	700	668	403623	416714	418433	102	97	103	103
29	1047	1062	1194	399488	335137	428672	101	114	83	107
30	58	97	108	27025	43925	51275	167	186	162	189
31	552	710	816	266155	339125	381894	128	147	127	143
32	201	154	272	125992	111790	150446	76	135	88	119
33	833	885	788	504502	506282	478936	106	94	100	94
34	45	52	53	23403	24445	40235	115	117	104	171
35	973	1014	923	514395	537379	523250	104	94	104	101
37	1074	1178	1117	420250	448253	431001	109	104	106	102
38	-1	-1	73	-1	-1	4932	-1	-1	-1	-1
39	314	307	335	193815	173109	203785	97	106	89	105
40	151	157	157	80202	86060	86182	103	103	107	107
41	284	251	211	241289	144469	149559	88	74	59	61
42	13	19	29	10125	11297	18086	146	223	111	178
43	412	427	353	197082	196849	206256	103	85	99	104
44	732	908	810	353331	429107	356275	124	110	121	100
45	279	277	297	142212	154472	165407	99	106	108	116
46	261	276	262	164220	169059	163144	105	100	102	99
47	510	541	637	236690	263384	265910	106	124	111	112
48	492	483	486	252458	232174	244322	98	98	91	96
49	886	922	757	545265	592613	475790	104	85	108	87
50	320	327	279	186609	195970	181596	102	87	105	97
51	237	242	257	148660	146673	161034	102	108	98	108
52	1247	1294	1411	621192	696255	859183	103	112	112	139
53	805	827	708	458703	427744	433626	102	88	93	94
54	1056	1099	1088	494892	535601	537323	104	103	108	108
55	43	63	60	47109	88167	102550	146	139	187	217
56	524	455	601	159233	192727	194072	86	114	121	121

Table 20

The presentation of scholastic achievement by sex as measured by average SAT (first six columns) and high school standing of the median entering freshman (second six columns), does not presuppose any inherent characteristic differences between the abilities of either men or women. The purpose of the table is to provide a view of a few of the components of change in average SAT scores at responding institutions.

Data on freshman SAT scores and high school standing broken out by sex are not available at most institutions, which this table amply indicates. From the data available it appears that change in the average SAT for any school is reflected in almost equal changes in SAT for both men and women as individual groups.

The high school standing of the median entering freshman at each college graduated from high school in the top percentile group shown in the table. For example, the median female freshman entering in 1969 (in terms of her high school standing) at #5 graduated at the 34th percentile of her high school class. Data on high school standing is far too sparse however, to permit any conclusions, notwithstanding that admissions officers weight this measure more heavily than SAT scores.

Table 21

Table 21 presents data on the number of men and women enrolled at each institution reporting these statistics. The last three columns represent the number of women enrolled as a percent of total enrollment. Several interesting points emerge from these data.

For the most part, the proportion of women enrolled remains relatively constant for most schools. At school # 8 which is undergoing a period of rapid expansion, the proportion of women is increasing due to efforts by the administration to provide more courses in liberal arts rather than those oriented towards technical vocational areas of study. School # 12, on the other hand, which is also undergoing moderate expansion, is admitting more men than women. School # 12 has recently shifted from a predominantly teacher education oriented curricula to a more broadly based curricula in liberal arts.

School # 22 was a women's college until 1966 when men were admitted for the first time, accounting for the sharp drop over the three year period in the proportion of women enrolled. School # 56, an all male institution until 1960, shows a less rapid increase of women than # 22 did of men. This is probably due to the geographic location of # 56.

Table 20

Scholastic Achievement by Sex

#	Average SAT						High School Standing					
	1967		1968		1969		1967		1968		1969	
	M	**W**	**M**	**W**	**M**	**W**	**M**	**W**	**M**	**W**	**M**	**W**
1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
2	303	286	296	286	299	287	-1	-1	-1	-1	-1	-1
3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
5	-1	-1	412	399	391	427	-1	-1	44	36	43	34
6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
7	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
8	473	471	474	462	454	462	-1	-1	-1	-1	-1	-1
9	-1	-1	-1	-1	378	383	-1	-1	-1	-1	-1	-1
10	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
11	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
12	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
14	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
15	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
16	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
18	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
20	-1	-1	398	395	398	400	-1	-1	-1	-1	-1	-1
21	419	413	415	422	430	406	-1	-1	-1	-1	-1	-1
22	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
24	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
25	518	495	500	483	509	495	-1	-1	-1	-1	-1	-1
26	553	546	550	548	561	550	41	28	46	29	45	[illegible]
28	-1	-1	507	486	511	500	-1	-1	-1	-1	-1	-1
29	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
30	572	564	563	566	555	573	14	13	31	19	31	[illegible]
31	614	624	608	630	623	628	17	13	23	16	19	14
32	631	661	663	666	670	673	-1	-1	-1	-1	12	11
33	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
34	567	573	598	572	-1	-1	-1	-1	-1	-1	-1	-1
35	-1	-1	666	654	669	654	15	12	16	11	14	12
37	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
38	-1	-1	-1	-1	627	609	-1	-1	-1	-1	-1	-1
39	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
40	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
41	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
42	-1	473	-1	492	-1	525	-1	38	-1	31	-1	33
43	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
44	-1	-1	527	501	534	511	-1	-1	36	23	34	[illegible]
45	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
46	-1	553	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
47	-1	-1	-1	-1	492	490	27	17	-1	-1	35	[illegible]
48	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
49	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
50	527	544	536	565	556	574	27	17	29	19	33	16
51	-1	-1	-1	-1	553	566	-1	-1	-1	-1	[illegible]	24
52	-1	-1	470	430	463	448	38	29	38	27	36	28
53	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
54	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
55	[illegible]	[illegible]	709	679	650	634	-1	-1	14	12	-1	-1
56	-1	-1	420	412	405	402	-1	-1	45	37	40	[illegible]

Table 21

Enrollment by Sex

#	1967 M	1967 W	1968 M	1968 W	1969 M	1969 W	Pct. Women 1967	Pct. Women 1968	Pct. Women 1969
1	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
2	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
3	3031	3069	3242	3416	3476	3801	50	51	[illegible]
4	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
5	1800	1114	2180	1428	2292	1503	38	39	[illegible]
6	326	536	359	634	400	712	62	63	[illegible]
7	-1	-1	-1	-1	-1	-1	-1	-1	-1
8	279	369	266	467	356	581	56	63	[illegible]
9	1037	1295	1090	1339	1069	1197	55	55	[illegible]
10	1510	932	1677	1171	1879	1208	38	41	[illegible]
11	758	876	768	860	822	994	53	52	[illegible]
12	3204	2687	3928	2686	4844	2793	45	40	[illegible]
14	320	211	329	250	-1	-1	39	43	-1
15	-1	-1	-1	-1	-1	-1	-1	-1	-1
16	613	668	635	661	556	573	52	51	[illegible]
18	5027	4097	5564	4409	6042	4331	44	44	41
20	1875	1993	1930	1958	1950	1970	51	50	[illegible]
21	986	662	1072	689	1064	650	40	39	37
22	236	2457	488	2627	660	2788	91	84	[illegible]
24	1440	1557	1511	1631	1528	1498	51	51	[illegible]
25	1049	1027	1046	1005	939	1104	49	49	[illegible]
26	1073	749	1096	699	1132	770	41	38	[illegible]
28	-1	-1	-1	-1	-1	-1	-1	-1	-1
29	665	710	649	728	667	715	51	52	[illegible]
30	311	299	322	283	316	303	49	46	[illegible]
31	954	624	1041	696	1147	741	39	40	[illegible]
32	802	571	861	589	860	590	41	40	[illegible]
33	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
34	310	287	321	316	329	344	48	49	[illegible]
35	1172	951	1159	960	1223	983	44	45	[illegible]
37	1233	1005	1280	1135	1598	1195	44	46	[illegible]
38	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
39	609	355	559	376	462	358	36	40	[illegible]
40	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
41	4	1008	6	904	3	746	99	99	[illegible]
42	0	620	0	561	0	475	100	100	[illegible]
43	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
44	1762	1620	1870	1658	1873	1666	47	45	47
45	623	263	607	258	613	246	29	29	[illegible]
46	0	942	0	898	0	864	100	100	[illegible]
47	691	613	718	615	688	565	47	46	[illegible]
48	1043	642	966	593	940	571	38	38	[illegible]
49	-1	-1	-1	-1	-1	-1	-1	-1	-1
50	932	675	1007	813	1055	840	42	44	[illegible]
51	-1	-1	-1	-1	-1	-1	-1	-1	-1
52	-1	-1	-1	-1	-1	-1	-1	-1	-1
53	1042	1020	1085	1010	1213	1179	49	48	[illegible]
54	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]
55	735	558	734	551	745	558	43	42	[illegible]
56	834	118	821	170	855	203	12	17	[illegible]

II. PRELIMINARY ANALYSIS

Much of the data presented in Part I is based on statistical averages and determinations of statistically significant characteristics of schools. The purpose of this section is to provide some of the background data and statistics from which the material presented in Part I was developed.

To bring order to and to analyze all of the data brought together for this study, schools were grouped according to twenty-eight institutional and financial characteristics detailed in Illustration I on the following page. Sixty-four individual data items (such as revenue and expenditure distributions, admissions statistics, SAT scores, etc.) were then collected and aggregated according to schools with similar characteristics. For each institutional characteristic and each data item cross-tabulated in this fashion, four statistics were computed:

1. number of institutions exhibiting the particular characteristic in question (#)
2. mean of the particular data from this group of schools $(\bar{x})$
3. standard deviation of the data (σ)
4. standard deviation of the mean $(\sigma_{\bar{x}})$

The computations described above were performed once for all schools considered in the total sample, and then for all of the individual groups of schools based on similar characteristics. Determination of the most significant characteristics of different groups of schools were made by comparisons between the means and the standard deviation of the means for the entire sample of schools and for each subsample. If both the mean of the total sample and the mean of the subsample were at least two standard deviations $(\sigma_{\bar{x}})$ away from each other, it was assumed that the subsample and the particular characteristic and data item represented by it were different from the total sample of schools by a statistically significant amount. Those characteristics determined to be significant in this manner are presented in the following discussion.

Characteristics	Institutional and Financial Characteristics				
1. All schools					
2. Region	East	South	West	Plains	Mid-West
3. Location		central city	suburb	urban	rural
4. Control		public	independent	religious	
5. Instruction		academic	utilitarian	general	
6. Records		excellent	good	variable	poor
7. Entrance standards		most comp.	very comp.	comp.	less comp.
8. Student char.		w/county	w/state	regional	national
9. Pop. served		rel. prot.	rel. cath	black	none
10. SES		low	blue col.	white col.	prof'l
11. Enroll. size	0-1000	1000-2000	2000-3000	3000-4000	4000
12. Enroll. growth		increase	decrease	no trend	
13. % women	40%	40-45%	45-49%	50-55%	56%+
14. Fed. aid ($) growth	0-100,000	100,000-200,000	200,000-350,000	350,000-450,000	450,000+
15. Per rec. aid growth	0-350	351-450	451-550	551-625	626+
16. Per enr. aid growth	0-50	51-100	101-150	151-200	200+
17. SAT	400	400-475	476-525	526-575	576+
18. SAT growth		increase	decrease	no trend	
19. Gap size	0	1-50	51-150	151-250	250+
20. Gap growth		increase	decrease	no trend	
21. Gap/stud. size	0	1-50	51-150	151-250	250+
22. Gap/stud. growth		increase	decrease	no trend	
23. R/E size	.99	1.00-1.04	1.05-1.09	1.10-1.14	1.15+
24. R/E growth		increase	decrease	no trend	
25. Ave. class size	14-16	17-19	20-22	23-25	25+
26. Stud. fac. ratio adj'd	7-11.99	12.0-15.99	16.0-19.99	20.0-23.99	24+
27. Tuition ratio growth	0-13	14-26	27-39	40-53	54+
28. Fresh. growth		increase	decrease	no trend	

A. Revenue and Expenditure Distribution

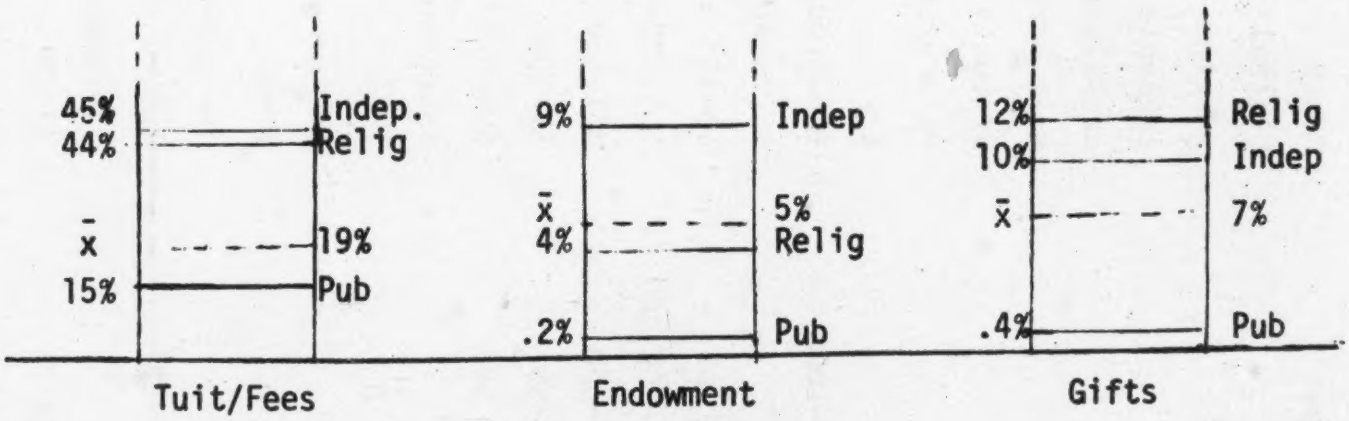
A summary of revenue and expenditure distributions for all schools during the period 1967-1969 is presented in Table II - 1 (number of observations, mean, standard deviation, and standard deviation of the mean). The rather large standard deviations suggest a low degree of homogeneity among the various schools as a total group with respect to all revenue and expenditure categories.

An alternative way of examining this data is to break out the revenue and expenditure distributions by school according to type of control and type of instruction with the result that a greater degree of homogeneity of distributions is achieved. These data are presented in Table II- 2 and II.- 3 and are summarized in the following charts.

Chart II - A

Revenue Distribution - Significant Differences

By Type of Control



By Type of Instruction

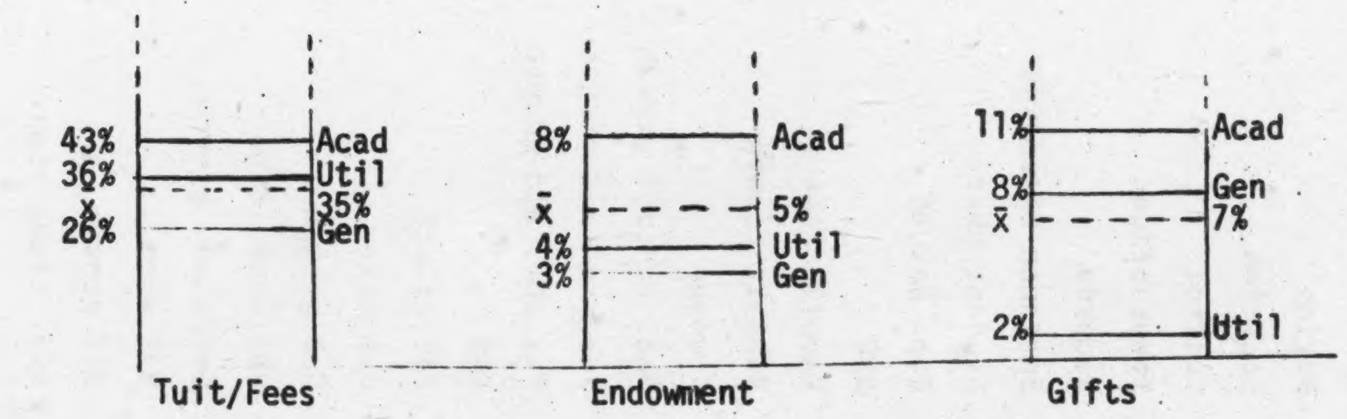


Table II - 1

Revenue and Expenditure Distributions
Supporting Data
(Percent)

Expenditures

		1967	1968	1969
Instruction	#	31.	31.	31.
	$\bar{x}$	29.7	30.2	30.1
	σ	97.1	94.5	90.8
	$\sigma_{\bar{x}}$	1.74	1.70	1.63
Research		31.	31.	31.
		1.2	1.4	1.4
		2.64	2.54	2.19
		.47	.46	.39
Library and Audio-Visual		31.	31.	31.
		4.0	4.0	4.0
		2.22	1.83	1.84
		.40	.33	.33
Facilities O & M		31.	31.	31.
		11.2	10.6	11.2
		3.31	3.11	3.44
		.59	.56	.62
Administration		31.	31.	31.
		16.7	16.3	16.6
		4.52	4.14	3.75
		.81	.74	.67
Student Services		31.	31.	31.
		2.8	2.8	2.6
		2.09	2.24	2.18
		3.7	4.0	3.9
Student Aid		31.	31.	31.
		7.2	7.5	7.3
		4.60	4.76	4.74
		.83	.86	.85
Public Service		31.	31.	31.
		3.3	3.5	4.0
		2.88	3.00	3.69
		.52	.54	.66
Staff Benefits		31.	31.	31.
		3.2	3.6	4.0
		2.14	2.16	2.25
		.38	.39	.40
Auxiliary Services		31.	31.	31.
		20.7	20.1	18.9
		8.70	8.15	8.15
		1.56	1.46	1.46

Revenues

		1967	1968	1969
Tuition and Fees	#	31.	31.	31.
	$\bar{x}$	35.4	35.4	36.2
	σ	18.71	18.64	18.61
	$\sigma_{\bar{x}}$	3.36	3.35	3.34
Endowment		31.	31.	31.
		5.0	5.4	5.4
		6.92	6.91	6.97
		1.24	1.24	1.25
Gifts		31.	31.	31.
		7.4	7.7	8.0
		7.09	6.84	6.92
		1.27	1.23	1.24
State Government		31.	31.	31.
		16.3	15.4	16.1
		24.80	23.33	24.64
		4.45	4.19	4.42
Other Government		31.	31.	31.
		3.9	4.9	5.0
		6.07	9.03	8.24
		1.09	1.62	1.48
Research Revenue		31.	31.	31.
		2.3	2.5	2.6
		7.67	7.85	7.65
		1.38	1.41	1.37
Educational Services		31.	31.	31.
		3.3	3.2	2.8
		4.57	4.64	3.16
		.82	.83	.57
Other		31.	31.	31.
		1.6	1.5	1.3
		2.09	2.09	1.42
		.38	.38	.25
Auxiliary Services		31.	31.	31.
		24.9	23.9	22.6
		10.02	9.26	8.54
		1.80	1.66	1.53

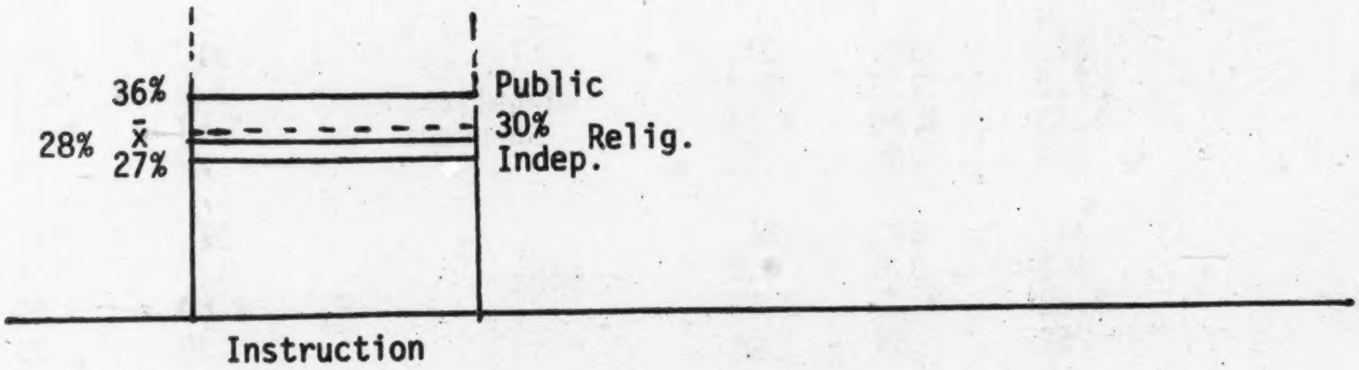
Tests for statistical significance were performed on the data presented in Tables II - 2 and II - 3 with few very conclusive results. In terms of the distribution of revenues for schools grouped according to type of instruction, Tuition/Fees, Endowment and Gifts varied by statistically significant amounts among the three categories of schools. As mignt be expected, Public schools had a much smaller proportion of their total revenue from Tuition/Fees (15%) than all other schools combined. The proportion of total revenues from Endowment and Gifts was also significantly smaller at Public schools than all schools as a group (.2% and .4% respectively). As a revenue item, Gifts at Religious schools are a significantly larger revenue (12%).

When divided according to type of instruction, schools exhibit statistically significant differences in total revenue distribution for the items Tuition/Fees, Endowment, and Gifts again. The general test for significance indicated that Academic schools are more dependent on Tuition/Fees (43%) and Endowment (8%) than all other schools. Utilitarian schools, on the other hand, are least dependent on Tuition/Fees (26%) and also Gifts (2%). In part this can be explained by the fact that most of the Utilitarian schools are also Public. Supporting data for these conclusions are provided in Table II - 4.

Chart II - B

Expenditure Distribution - Significant Differences

By Type of Control



By Type of Instruction

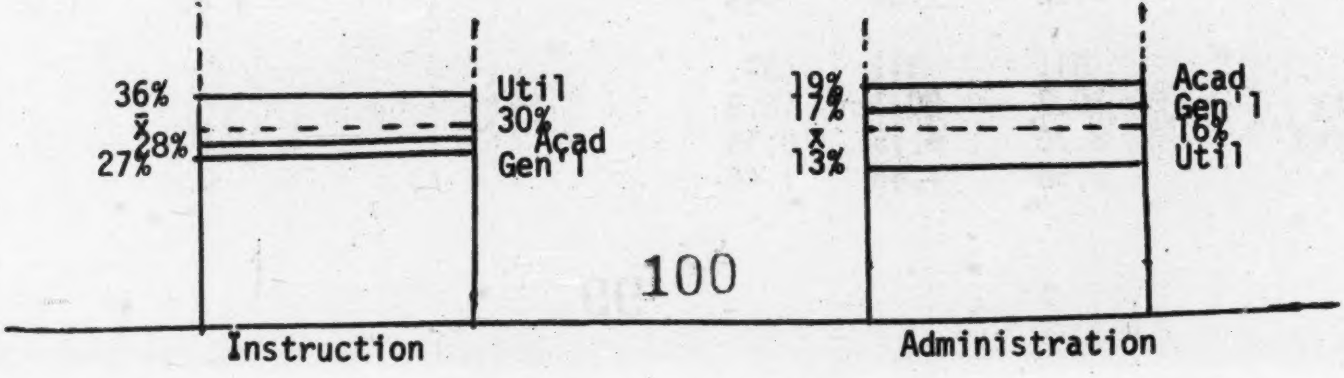


Table II - 2

Revenue Distribution and Growth

	% 1967	% 1968	% 1969	% Change from Initial Year 67-68	 68-69
By Type of Control:					
Public					
Tuition/Fees	15.3	15.4	16.5	.6	7.1
Endowment	.2	.7	.6	250.0	-14.2
Gifts	.4	.8	.5	200.0	-37.5
Gov't.	57.6	56.8	58.0	- 1.3	2.1
Aux Serv.	21.1	21.2	20.8	.4	- 1.8
Independent					
Tuition/Fees	45.4	46.5	47.6	2.4	2.3
Endowment	8.7	9.0	8.8	3.4	- 2.2
Gifts	10.4	10.7	10.4	2.8	- 2.8
Gov't.	2.2	2.0	2.5	- 9.0	25.0
Aux Serv.	24.7	23.5	22.1	- 4.8	- 5.9
Religious					
Tuition/Fees	44.1	42.0	41.4	- 5.1	- 1.4
Endowment	4.4	5.1	5.4	15.9	5.8
Gifts	11.5	11.8	14.1	2.6	19.4
Gov't.	2.7	4.9	5.6	81.4	14.2
Aux Serv.	30.5	28.5	26.2	- 6.5	- 8.0
By Type of Instruction:					
Academic					
Tuition/Fees	42.7	43.2	44.3	1.1	2.5
Endowment	8.4	8.4	8.5	0.0	1.1
Gifts	10.8	11.4	10.2	5.5	-10.5
Gov't.	8.8	8.4	9.4	- 4.5	11.9
Aux Serv.	24.8	24.2	23.0	- 2.4	- 4.9
Utilitarian					
Tuition/Fees	25.9	26.1	27.8	.7	6.5
Endowment	3.7	4.4	4.2	18.9	- 4.5
Gifts	2.3	2.4	3.2	4.3	33.3
Gov't.	35.9	34.8	35.9	- 3.0	3.1
Aux Serv.	18.8	19.3	18.4	2.6	- 4.6
General					
Tuition/Fees	35.6	35.2	35.2	- 1.1	0.0
Endowment	3.1	3.8	3.8	22.5	0.0
Gifts	8.0	8.2	9.3	2.5	13.4
Gov't.	19.3	20.5	21.0	6.2	2.4
Aux Serv.	28.6	26.5	24.9	- 7.3	- 6.0

Table II - 3

Expenditure Distribution and Growth

	% 1967	% 1968	% 1969	% Change from Initial Year 67-68	 68-69
By Type of Control:					
Public					
Instruction	36.2	37.7	37.7	4.1	0.0
Facil O & M	10.5	9.7	10.7	- 7.6	10.3
Admin.	13.8	13.0	13.0	- 5.7	0.0
Stu Serv.	3.1	3.4	2.8	9.6	-17.6
Aux Serv.	19.0	18.2	16.9	- 4.2	- 7.1
Independent					
Instruction	25.9	26.4	26.5	1.9	.3
Facil O & M	12.1	11.5	11.6	- 4.9	.8
Admin.	18.0	18.1	18.6	.5	2.6
Stu Serv.	2.7	2.6	2.4	- 3.7	- 7.6
Aux Serv.	21.1	20.8	19.9	- 1.4	- 4.3
Religious					
Instruction	27.8	26.8	26.4	- 3.5	- 1.4
Facil O & M	10.5	10.1	11.0	- 3.8	8.9
Admin.	18.0	17.7	17.8	- 1.6	.5
Stu Serv.	2.4	2.3	2.6	- 4.1	13.0
Aux Serv.	22.5	21.4	19.6	- 4.8	- 8.4
By Type of Instruction:					
Academic					
Instruction	27.8	27.9	27.4	.3	- 1.7
Facil O & M	11.7	11.0	11.1	- 5.9	.9
Admin.	18.5	18.8	18.8	1.6	0.0
Stu Serv.	2.5	2.5	2.3	0.0	- 8.0
Aux Serv.	19.9	16.2	20.1	-18.5	24.0
Utilitarian					
Instruction	35.7	36.2	36.0	1.4	- .5
Facil O & M	11.3	10.6	11.5	- 6.1	8.4
Admin.	13.1	13.7	14.4	4.5	5.1
Stu Serv.	2.6	2.8	2.0	7.6	-28.5
Aux Serv.	22.4	22.1	20.0	- 1.3	- 9.5
General					
Instruction	27.4	28.2	28.5	2.9	1.0
Facil O & M	10.8	10.4	11.0	- 3.7	5.7
Admin.	17.4	16.1	16.3	- 7.4	1.2
Stu Serv.	3.1	3.0	3.1	- 3.2	3.3
Aux Serv.	21.5	18.8	16.8	-12.5	-10.6

Table II - 4a

Revenue Distribution - Supporting Data

		1967	1968	1969
ALL SCHOOLS				
Tuition/Fees	#	31.	31.	31.
	$\bar{x}$	35.4	35.4	36.2
	σ	18.71	18.64	18.61
	$\sigma_{\bar{x}}$	3.36	3.35	3.34
Endowment		31.	31.	31.
		5.0	5.4	5.4
		6.92	6.91	6.97
		1.24	1.24	1.25
Gifts		31.	31.	31.
		7.4	7.7	8.0
		7.09	6.84	6.92
		1.27	1.23	1.24
PUBLIC				
Tuition/Fees		10.	10.	10.
		15.3	15.4	16.5
		6.28	5.55	5.92
		1.98	1.76	1.87
Endowment		10.	10.	10.
		.2	.7	.6
		.53	1.51	1.08
		.17	.48	.34
Gifts		10.	10.	10.
		.4	.8	.5
		.71	1.11	.60
		.23	.35	.19

	1967	1968	1969
INDEPENDENT			
Tuition/Fees	14.	14.	14.
	45.4	46.5	47.6
	17.33	17.35	17.52
	4.63	4.64	4.68
Endowment	14.	14.	14.
	8.7	9.0	8.8
	8.60	8.41	8.53
	2.30	2.25	2.28
Gifts	14.	14.	14.
	10.4	10.7	10.4
	5.74	6.26	4.90
	1.53	1.67	1.31
RELIGIOUS			
Tuition/Fees	7.	7.	7.
	44.1	42.0	41.4
	6.67	5.51	5.69
	2.52	2.08	2.15
Endowment	7.	7.	7.
	4.4	5.1	5.4
	3.03	3.99	4.06
	1.14	1.51	1.53
Gifts	7.	7.	7.
	11.5	11.8	14.1
	7.46	5.20	6.03
	2.82	1.97	2.28

Table II - 4b

Revenue Distribution - Supporting Data

Type of Instruction

		1967	1968	1969		1967	1968	1969
ALL SCHOOLS					UTILITARIAN			
Tuition/Fees	#	31.	31.	31.	Tuition/Fees	8.	8.	8.
	$\bar{x}$	35.4	35.4	36.2		25.9	26.1	27.8
	σ	18.71	18.64	18.61		27.12	27.18	25.53
	$\sigma_{\bar{x}}$	3.36	3.35	3.34		9.59	9.61	9.03
Endowment		31.	31.	31.	Endowment	8.	8.	8.
		5.0	5.4	5.4		3.7	4.4	4.2
		6.92	6.91	6.97		8.16	8.62	8.55
		1.24	1.24	1.25		2.88	3.05	3.02
Gifts		31.	31.	31.	Gifts	8.	8.	8.
		7.4	7.7	8.0		2.3	2.4	3.2
		7.09	6.84	6.92		4.48	4.48	5.24
		1.27	1.23	1.24		1.59	1.58	1.85
ACADEMIC					GENERAL			
Tuition/Fees		10.	10.	10.	Tuition/Fees	13.	13.	13.
		42.7	43.2	44.3		35.6	35.2	35.2
		13.86	13.81	15.79		14.05	13.67	13.98
		4.38	4.37	4.99		3.90	3.79	3.88
Endowment		10.	10.	10.	Endowment	13.	13.	13.
		8.4	8.4	8.5		3.1	3.8	3.8
		8.70	8.23	8.39		3.11	3.74	3.76
		2.75	2.60	2.65		.86	1.04	1.04
Gifts		10.	10.	10.	Gifts	13.	13.	13.
		10.8	11.4	10.2		8.0	8.2	9.3
		6.26	6.81	58.4		7.57	6.30	7.52
		1.98	2.15	1.85		2.10	1.75	2.08

Table II - 5

Expenditure Distribution - Supporting Data

		CONTROL		
		1967	1968	1969
ALL SCHOOLS				
Instruction	$\#$	31.	31.	31.
	$\bar{x}$	29.7	30.2	30.1
	σ	9.71	9.45	9.08
	$\sigma_{\bar{x}}$	1.74	1.70	1.63
Administration		31.	31.	31.
		16.7	16.3	16.6
		4.52	4.14	3.75
		.81	.74	.67
PUBLIC				
Instruction		10.	10.	10.
		36.2	37.7	37.7
		13.08	11.73	10.73
		4.14	3.71	3.39
Administration		10.	10.	10.
		13.8	13.0	13.0
		68	2.85	2.51
		1.48	.90	.79
INDEPENDENT				
Instruction		14.	14.	14.
		25.9	26.4	26.5
		6.65	6.24	6.28
		1.78	1.67	1.68
Administration		14.	14.	14.
		18.0	18.1	18.6
		4.42	4.46	3.35
		1.18	1.19	.90
RELIGIOUS				
Instruction		7.	7.	7.
		27.8	26.8	26.4
		3.45	3.85	3.68
		1.31	1.46	1.39
Administration		7.	7.	7.
		18.0	17.7	17.8
		2.69	1.66	2.14
		1.02	.63	.81

		INSTRUCTION		
		1967	1968	1969
ALL SCHOOLS				
Instruction	$\#$	31.	31.	31.
	$\bar{x}$	29.7	30.2	30.1
	σ	9.71	9.45	9.08
	$\sigma_{\bar{x}}$	1.74	1.70	1.63
Administration		31.	31.	31.
		16.7	16.3	16.6
		4.52	4.14	3.75
		.81	.74	.67
ACADEMIC				
Instruction		10.	10.	10.
		27.8	27.9	27.4
		6.73	6.11	5.40
		2.13	1.93	1.71
Administration		10.	10.	10.
		18.5	18.8	18.8
		4.57	4.54	3.28
		1.44	1.44	1.04
UTILITARIAN				
Instruction		8.	8.	8.
		35.7	36.2	36.0
		15.11	14.06	13.38
		5.34	4.97	4.73
Administration		8.	8.	8.
		13.1	13.7	14.4
		2.18	2.62	3.07
		.77	.92	1.09
GENERAL				
Instruction		13.	13.	13.
		27.4	28.2	28.5
		6.00	6.89	6.94
		1.66	1.91	1.93
Administration		13.	13.	13.
		17.4	16.1	16.3
		4.55	3.70	3.77
		1.26	1.03	1.05

Far fewer conclusive although much stronger results were obtained when tests for statistical significance were applied to expenditure distributions. When divided according to type of control, expenditures on Instruction varied significantly for all three types of schools. Public schools put significantly more of their total expenditures toward Instruction (36%) than both Independent and Religious schools which put approximately 26% and 28% of their total expenditures to Instruction respectively. When divided according to type of instruction, all three categories of school also vary by statistically significant amounts in their allocations to Instruction. Utilitarian schools spend approximately 36% of total expenditures on Instruction while Academic and General institutions spend approximately 28% and 27% respectively on Instruction. These differences are the likely result of the distribution of Public and Religious schools within the Utilitarian and General categories. Another slightly less strong, though still statistically significant result is that expenditures on Administration tend to be higher at Academic institutions (19%) than for all schools considered as a group. Supporting data for these conclusions are provided in Table II - 5.

B. Revenue-Expenditure Growth

Is the financial problem of institutions of higher education more one of lagging revenue or uncontrolled expenditure? Obviously the two problems are related, however, if a practical solution to the current funding crisis is to be found, this issue must be considered. The data presented in Table II -6 do not answer this question, but they do provide a perspective on the growth patterns of both revenues and expenditures for all of the schools considered in this study. The schools are divided first by type of control, which is important to the consideration of revenue growth, and then by type of instruction, a consideration of importance for expenditure growth.

	TOTAL			ACADEMIC			UTILITARIAN			GENERAL		
		1967-68	1968-69		1967-68	1968-69		1967-68	1968-69		1967-68	1968-69
1		31.	31.	0.	10.	10.	0.	8.	8.		13.	13.
		143.	116.	0.	101.	113.	0.	126.	123.		197.	112.
	0.0	120.6	94.1	0.0	49.3	90.0	0.0	59.4	113.0	0.0	166.6	92.2
	0.0	21.7	16.9	0.0	15.6	28.4	0.0	21.0	39.9	0.0	46.2	25.6
2	0.	31.	31.	0.	10.	10.	0.	8.	9.	0.	13.	13.
	0.	137.	127.	0.	100.	138.	0.	135.	148.	0.	166.	106.
	0.0	63.5	85.2	0.0	43.9	82.8	0.0	62.3	107.1	0.0	65.6	73.8
	0.0	11.4	15.3	0.0	13.9	26.2	0.0	22.0	37.9	0.0	13.2	20.5

	TOTAL	PUBLIC			INDEPENDENT			RELIGIOUS		
1	(above)	0.	10.	10.	0.	14.	14.		7.	7.
		0.	227.	144.	0.	82.	93.		165.	129.
		0.0	155.2	120.9	0.0	46.2	69.6	0.0	104.9	93.7
		0.0	49.1	38.2	0.0	12.3	18.6	0.0	39.6	35.4
2		0.	10.	10.	0.	14.	14.	0.	7.	7.
		0.	153.	167.	0.	94.	[illegible]	0.	178.	104.
		0.0	43.1	120.1	0.0	52.4	69.1	0.0	44.8	55.9
		0.0	19.8	33.0	0.0	15.9	15.9	0.0	26.9	[illegible]

Table 6. Revenue and Expenditures Increases, 1967-68 and 1968-69, by Type of Institution

Average revenue increase over earlier year (#1, divide by 10)
Average expenditure increase over earlier year (#2, divide by 10)

C. Measures of Financial Health

A simple comparison of total revenues and total expenditures at most schools will lead to the conclusion that higher education is indeed in serious financial trouble. As has been reported in several studies, many schools currently are running a deficit, while many of those still in the black are headed for trouble. The financial health of an institution may not be best measured by this simple comparison as the determinants of both revenues and expenditures remain hidden within complicated accounting procedures and a maze of funds and transfers.

CRA methodology prefers to compare total current expenditures with total annual revenues, the assumption being that a school in serious financial trouble is one which cannot meet current operating expenditures with total revenue. The difference or the margin by which current operating expenditures and revenues are met or surpassed has been termed as the "gap," normally computed on a per student basis. Another way of representing this same indicator of financial health without involving student count is to compute the revenue/expenditure ratio which is a comparable statistic for all institutions. Table II - 7 presents data on three measures of financial health used in this study: gap, gap per student, and revenue/expenditure ratio.

With these measures of financial health, it is possible to specify certain institutional and financial characteristics which are indicative of various degrees of health. Applying the test for statistical significance described in the introduction, several relatively strong indicators were determined and are summarized in Table II - 8. Though not perfectly applicable to each and every institution, these indicators describe a general pattern of characteristics of schools in poor financial condition as well as those in robust health.

	TOTAL			PUBLIC			INDEPENDENT			RELIGIOUS		
	1967	1968	1969	1967	1968	1969	1967	1968	1969	1967	1968	1969
12	31.	31.	31.	10.	10.	10.	14.	14.	14.	7.	7.	7.
	2867.	3173.	3178.	1513.	3222.	2818.	3962.	3799.	5548.	1275.	1410.	2441.
	3121.9	4073.6	5925.0	1477.7	3780.5	5052.6	5183.2	5084.0	7734.7	1795.7	1236.0	2504.1
	636.4	733.6	1034.2	467.3	1195.5	1597.8	1385.3	1358.8	2067.2	678.7	457.2	946.5
13	30.	30.	31.	10.	10.	10.	13.	13.	14.	7.	7.	7.
	124.	147.	125.	73.	133.	111.	210.	193.	135.	81.	83.	124.
	123.6	155.1	153.7	73.0	129.3	140.5	141.5	158.2	209.5	96.8	57.6	94.[illegible]
	23.5	24.7	29.4	23.3	41.0	44.3	39.2	43.9	56.0	37.3	21.7	35.8
14	31.	31.	31.	10.	10.	10.	14.	14.	14.	7.	7.	7.
	108.	108.	105.	104.	110.	107.	108.	106.	104.	105.	102.	104.
	8.0	10.1	10.2	5.5	14.5	13.3	10.4	8.2	10.3	4.8	3.8	3.3
	1.4	1.8	1.8	1.7	4.6	4.2	2.8	2.2	2.7	1.8	1.4	1.3

	TOTAL	ACADEMIC			UTILITARIAN			GENERAL		
12	(above)	10.	10.	10.	8.	8.	8.	13.	13.	13.
		2425.	2586.	2233.	4949.	4717.	4569.	1456.	2437.	2884.
		2628.6	3340.3	4530.1	6559.0	5859.1	9249.2	1504.6	3301.4	4511.1
		631.2	1056.3	1432.5	2319.2	2071.5	3270.1	417.3	915.7	1251.2
13		[illegible]	9.	[illegible]	[illegible]	[illegible]	[illegible]	13.	13.	13.
		[illegible]	172.	85.	[illegible]	169.	15[illegible].	92.	117.	140.
		[illegible]	147.7	171.4	[illegible]	150.1	[illegible]	102.9	121.[illegible]	153.8
		[illegible]	49.2	54.2	68.7	55.1	75.4	26.5	33.[illegible]	37.[illegible]
14		[illegible]	10.	10.	[illegible]	8.	[illegible]	13.	13.	13.
		[illegible]	104.	[illegible]	[illegible]	[illegible]	[illegible]	104.	[illegible]	[illegible]
		[illegible]	3.3	5.5	13.4	9.9	12.[illegible]	4.9	13.[illegible]	[illegible].7
		[illegible]	1.2	1.2	[illegible]	3.5	4.[illegible]	1.4	3.[illegible]	3.2

Table 7. Revenue-Expenditure Analysis by Type of Institution

Average Revenue-Expenditure Gap per School (#12, $1000)
Average Revenue-Expenditure Gap per Student (#13, $)
Average Revenue-Expenditure Ratio (#14, %)

Of the three measures of financial health examined, the revenue/expenditure ratio has proven to be the most useful in determining the financial situation of a school. Four categories of financial strength based on revenue/expenditure ratio were developed and are expressed as a percent on the following table (≤99%, 100-104%, 105-109%, and 110+%). A school with a revenue/expenditure ratio falling within the first group is considered to be in serious financial trouble (current operating expenditures exceed total revenues). Schools with ratios falling within the next two categories are in fair financial shape, however, their future financial strength can be considered as somewhat uncertain. Schools with revenue/expenditure ratios greater than 110% are considered to be in excellent shape.

Table II - 8 presents a listing of the significant characteristics of financial health based on the revenue/expenditure measure. Though seven characteristics are listed, each with data on the four categories of revenue/expenditure included, the characteristics are not indicative of each R/E category or level of financial health. In sum, the financially marginal schools (i.e., those with R/E ratios less than 99%) are characterized by smaller enrollments, low teaching loads and class sizes, and relatively heavy dependence on tenured staff. They also tend to be those which allocate relatively less of their budgets to instruction and more to student aid, public service, and research. The "affluent" colleges (i.e., with operating ratios of 110% or higher) demonstrate opposite characteristics and, in addition, show relatively low participation in Federal student aid programs, tend to accept virtually every applicant, have comparatively low SAT score averages, and have low costs per credit hour.

Code	≤99% 1967	≤99% 1968	≤99% 1969	100-104% 1967	100-104% 1968	100-104% 1969	105-109% 1967	105-109% 1968	105-109% 1969	110+% 1967	110+% 1968	110+% 1969
	Revenue-to-Expenditure Ratio											
7	4.	4.	4.	11.	12.	12.	5.	5.	3.	4.	4.	4.
	17969.	20136.	21519.	9235.	9966.	11777.	7279.	6939.	[illegible]	4325.	4313.	4494.
	9582.4	11872.4	12607.7	5006.0	4665.3	5527.8	3749.9	708.0	1713.8	1013.9	1157.0	485.4
	4791.2	5936.2	6303.9	1509.4	1346.7	1595.7	1677.0	316.6	989.4	506.9	578.5	242.7
9	5.	5.	7.	11.	12.	12.	5.	6.	6.	3.	4.	4.
	531.	540.	519.	510.	514.	516.	528.	519.	534.	478.	465.	469.
	139.2	151.2	130.7	81.9	73.6	78.5	82.3	77.1	71.8	21.2	45.6	37.9
	62.3	67.6	49.4	24.7	21.2	22.7	36.8	31.5	29.3	12.2	22.8	18.9
11	7.	7.	8.	12.	12.	12.	6.	6.	6.	5.	5.	5.
	1452.	1497.	1389.	1231.	1278.	1306.	2083.	2122.	2181.	2811.	3223.	3396.
	581.4	648.1	688.3	802.2	836.4	833.1	1113.0	1151.3	1129.2	708.1	876.2	708.3
	219.7	245.0	243.3	231.6	241.4	240.5	454.4	470.0	461.0	316.7	391.9	316.8
15	7.	9.	7.	9.	8.	8.	5.	5.	4.	3.	2.	2.
	[illegible]	[illegible]	55.	75.	70.	70.	75.	72.	73.	75.	82.	82.
	[illegible]	11.3	21.1	15.7	13.1	15.8	20.5	[illegible]	15.2	22.1	24.7	24.0
	[illegible]	5.3	[illegible]	5.2	4.6	5.9	9.2	[illegible]	7.1	12.7	17.5	[illegible]
16	4.	4.	4.	11.	11.	11.	5.	5.	3.	4.	4.	4.
	2747.	2737.	2585.	3145.	3104.	3184.	3216.	3017.	3210.	4063.	3919.	4271.
	1019.9	1001.4	1002.2	1160.7	1467.0	1293.3	497.2	714.6	957.7	341.9	418.1	962.1
	509.9	500.7	501.1	350.0	442.3	390.1	222.4	319.6	552.9	171.0	209.0	481.0
17	4.	4.	4.	11.	12.	12.	5.	5.	3.	4.	4.	4.
	19.	18.	18.	20.	22.	21.	26.	23.	21.	24.	27.	24.
	1.9	1.8	1.5	3.6	3.9	3.7	3.8	3.9	2.9	3.3	4.6	3.9
	0.9	0.9	0.8	1.2	1.7	[illegible]	1.7	1.3	1.7	1.7	2.3	1.9
26	5.	6.	6.	12.	12.	12.	5.	5.	5.	5.	5.	5.
	64.	63.	65.	81.	77.	65.	70.	67.	76.	50.	46.	51.
	15.7	11.2	12.1	[illegible]	34.5	56.2	24.2	22.5	[illegible]	18.0	14.6	20.6
	7.0	4.6	4.9	11.7	[illegible]	15.2	10.8	[illegible]	[illegible]	8.1	6.6	9.2

Table II - 8. Significant Characteristics of Financial Health

Code 7. Total Cost Per Credit Hour ($, divide by 100)
Code 9. SAT scores average
Code 11. Enrollment
Code 15. Freshman Acceptance Ratio
Code 16. Annual Teaching Load Average (hrs. Divide by 10
Code 17. Average Class Size
Code 26. Ratio: Tenured to Non-tenured (%)

D. Instruction Characteristics and Costs

A number of cost factors related to instruction expenditures were considered in order to establish more precisely the specific components of change and the impact which each has had over the three year period of the study. They were:

- average faculty salaries
- average teaching hours
- student/faculty ratio
- class size distribution

The summary of data on these different factors is presented in Table II - 9 and II -10.

E. Federal Student Aid

Data were collected on the total amount of federal student aid awarded as well as the number of awards made under the College Work/Study Program, Educational Opportunity Grant program, and the National Defense Student Loan Program. These data were aggregated for the schools according to type of control and type of instruction to provide part of the background for analysis of the budget data and cost data. Regression analysis and analysis of variance were two techniques used to explore the relationship between federal aid programs and budget allocations in order to determine the impact which the aid programs have had on internal resource allocations at these schools. Though only the data summarizing the federal aid programs for the basic types of schools considered are presented in Table II - 11 the next two chapters document the statistical conclusions of these analyses in more detail.

	1967	1968	1969	1967	1968	1969	1967	1968	1969	1967	1968	1969
		TOTAL			ACADEMIC			UTILITARIAN			GENERAL	
15	39.	41.	41.	11.	11.	11.	13.	13.	13.	15.	17.	17.
	9159.	9579.	10715.	11155.	11353.	11733.	9447.	10000.	10829.	8282.	9157.	9970.
	1504.3	1513.9	1527.4	1156.3	1256.0	1127.5	1108.8	1262.4	1280.3	1612.7	1521.5	1570.5
	240.0	236.4	238.5	321.2	381.7	340.0	307.5	350.1	336.3	416.4	369.0	362.4
16	33.	34.	32.	10.	9.	8.	10.	10.	9.	13.	15.	15.
	3077.	2975.	3076.	2749.	2487.	2325.	3429.	3495.	3802.	3059.	2922.	3037.
	898.9	1021.1	1102.9	974.0	822.6	810.9	1010.6	1382.5	958.3	688.0	702.2	1083.4
	156.1	175.1	201.4	308.2	274.2	286.7	319.6	437.2	316.8	190.8	181.3	300.5
25	29.	33.	32.	8.	8.	9.	8.	8.	8.	13.	17.	15.
	184.	175.	173.	146.	134.	139.	193.	204.	207.	200.	181.	176.
	69.3	57.5	72.2	59.1	39.0	69.1	30.8	24.7	40.5	87.0	66.2	81.3
	13.0	10.0	12.8	20.9	13.8	23.0	10.9	8.7	14.3	24.1	16.0	21.0

		TOTAL			PUBLIC			INDEPENDENT			RELIGIOUS	
15		(above)		15.	15.	16.	12.	14.	14.	12.	12.	11.
				9568.	10142.	11063.	9425.	10325.	11019.	8338.	9030.	9823.
				1198.7	1255.1	1305.8	1322.5	1393.5	1395.8	1860.1	1793.4	1744.3
				283.7	324.1	326.4	381.8	372.4	373.0	537.0	491.7	525.9
16				11.	12.	10.	12.	12.	11.	10.	10.	9.
				[illegible]	3342.	3716.	2775.	2745.	[illegible]	2941.	2812.	[illegible]
				[illegible]	1371.6	1230.5	980.1	901.8	1014.7	550.6	499.1	[illegible]
				284.3	363.9	389.1	282.9	260.3	305.9	174.1	157.8	[illegible]
25				11.	13.	12.	7.	9.	[illegible]	11.	11.	[illegible]
				[illegible]	192.	[illegible]	[illegible]	[illegible]	[illegible]	191.	[illegible]	[illegible]
				[illegible]	45.3	54.9	[illegible]	48.4	50.1	64.0	73.5	[illegible]
				[illegible]	12.8	15.9	[illegible]	15.5	17.7	25.3	[illegible]	[illegible]

Table 9. Faculty Salaries, Teaching Loads, and Student/Faculty Ratios by Type of Institution

Average Faculty Salary - $ (#15)
Average Annual Classroom Teaching Hours (#16, divide by 10)
Average Student/Faculty Ratio (#25, divide by 10)

	TOTAL			ACADEMIC			UTILITARIAN			GENERAL		
	1967	1968	1969	1967	1968	1969	1967	1968	1969	1967	1968	1969
18	36. 252. 116.9 19.5	35. 265. 111.3 18.9	33. 303. 120.9 21.1	10. 335. 124.4 39.3	10. 318. 116.8 38.9	9. 359. 127.7 42.6	11. 205. 99.0 29.9	10. 207. 90.7 28.7	9. 235. 91.5 30.5	15. 231. 100.7 26.0	15. 270. 107.6 27.8	15. 311. 119.5 30.9
19	36. 513. 89.9 15.0	35. 501. 85.7 14.5	33. 500. 86.1 15.0	10. 524. 100.7 31.6	10. 526. 91.0 23.8	9. 500. 93.3 31.1	11. 488. 79.0 23.8	10. 480. 77.6 24.6	9. 500. 79.6 26.5	15. 523. 92.4 23.9	15. 497. 88.6 22.9	15. 492. 90.7 23.4
20	36. 236. 105.6 17.6	35. 232. 101.9 17.2	33. 195. 97.7 15.3	10. 162. 82.3 26.0	10. 166. 77.3 24.4	9. 133. 80.0 26.7	11. 287. 122.9 37.1	10. 302. 100.6 31.8	9. 254. 85.0 28.3	15. 248. 81.6 21.1	15. 230. 91.3 23.6	15. 196. 71.4 18.4

	TOTAL			PUBLIC			INDEPENDENT			RELIGIOUS		
18	36. 252. 116.9 19.5	35. 265. 111.3 18.9	33. 303. 120.9 21.1	12. 205. 111.0 32.0	12. 197. 96.7 27.9	10. 240. 113.3 35.8	13. 294. 123.4 34.2	13. 292. 113.1 31.4	12. 327. 115.6 33.4	11. 253. 105.5 31.8	10. 312. 93.4 29.5	11. 335. 121.4 36.6
19	36. 513. 89.9 15.0	35. 501. 85.7 14.5	33. 500. 86.1 15.0	12. 528. 62.5 23.8	12. 516. 68.9 19.9	10. 521. 75.8 24.0	13. 520. 117.5 32.6	13. 511. 112.5 31.2	12. 502. 93.2 26.9	11. 487. 56.1 16.9	10. 468. 58.4 18.5	11. 480. 90.1 27.2
20	36. 236. 105.6 17.6	35. 232. 101.9 17.2	33. 195. 87.7 15.3	12. 248. 130.6 37.7	12. 234. 116.7 33.7	10. 236. 96.0 30.6	13. 201. 90.0 25.0	13. 196. 71.6 19.9	12. 169. 77.5 22.4	11. 264. 89.1 26.9	10. 217. 100.2 31.7	11. 186. 84.0 25.3
	1967	1968	1969	1967	1968	1969	1967	1968	1969	1967	1968	1969

Table 10. Distribution of Sections By Size and Type of Institution

Percent of classes with 1-10 students (#18)
Percent of classes with 11-30 students (#19)
Percent of classes with 31+ students (#20)
(Divide by 10)

	TOTAL 1967	TOTAL 1968	TOTAL 1969	ACADEMIC 1967	ACADEMIC 1968	ACADEMIC 1969	UTILITARIAN 1967	UTILITARIAN 1968	UTILITARIAN 1969	GENERAL 1967	GENERAL 1968	GENERAL 1969
21	48.	48.	49.	12.	12.	13.	14.	14.	14.	22.	22.	22.
	3112.	3208.	3151.	1796.	1853.	1801.	3844.	3995.	3891.	3364.	3447.	3476.
	2794.5	2808.6	2776.0	1537.9	1598.9	1593.7	2576.3	3411.6	3191.5	3273.6	2754.9	2872.6
	403.4	405.4	396.6	444.0	461.6	442.0	688.6	911.8	853.0	697.9	587.3	612.4
22	48.	48.	49.	12.	12.	13.	14.	14.	14.	22.	22.	22.
	684.	628.	678.	347.	369.	341.	1039.	1094.	987.	642.	909.	682.
	604.8	944.0	555.0	301.1	314.4	293.2	786.1	842.3	657.9	487.9	1152.9	502.9
	87.3	146.3	79.3	86.9	90.8	81.3	210.1	225.1	175.8	104.0	245.8	107.2

	TOTAL	PUBLIC 1967	PUBLIC 1968	PUBLIC 1969	INDEPENDENT 1967	INDEPENDENT 1968	INDEPENDENT 1969	RELIGIOUS 1967	RELIGIOUS 1968	RELIGIOUS 1969
21	(above)	20.	20.	20.	15.	15.	16.	13.	13.	13.
		3423.	3320.	3322.	3002.	3396.	3173.	2760.	2615.	2662.
		3645.2	2864.2	2962.2	2514.2	3437.5	3138.0	1732.4	1972.9	2117.4
		792.7	640.5	662.4	649.2	887.6	784.5	480.5	547.2	567.5
22		20.	20.	20.	15.	15.	16.	13.	13.	13.
		817.	1104.	832.	865.	721.	628.	509.	526.	565.
		827.3	1206.8	558.8	736.7	835.4	653.2	333.4	381.2	[illegible]
		140.3	259.8	124.9	190.2	215.7	163.3	92.5	100.2	99.5

Table 11. Federal Student Aid Statistics by Type of Institution

Average amount of Federal aid awarded (#21, multiply by 100)
Average number of awards made (#22)

III. REGRESSION ANALYSIS

A. Approach

In the usual regression analysis we seek, at least implicitly, to establish cause and effect relationships. Thus, for example, the terminology "dependent" and "independent" variable. For purposes of policy-making we are not so much interested in cause-and-effect as we are in establishing joint relationships (or occurrences) among variables.

To be specific, we might wish, for example, to define objectively a college's need for financial assistance. We cannot simply ask, however because colleges may not be altogether objective about their needs, especially where funds are allocated on the basis of need. Suppose, however, that we can identify some variable which appears to move simultaneously with "need" (which we are free to define as we please) but which is essentially beyond the control of the college (or at least its definition and measurement is beyond the college's control). "Enrollment", although admitting of some variation in definition, is a good example of such a variable.

In this study we use regression analysis to tell us which variables seem to move simultaneously. The purpose is to develop a background for policy formulation. The approach is substantially more exploratory than the mathematical statistician would care to endorse, since we will be testing hypotheses and searching for new ones at the same time.

The technique of stepwise regression [2, p. 42] is useful in this approach, since it offers precisely this type of systematic exploratory capability. In this approach it is hypothesized that the "dependent" variable is correlated with any number of possible "independent" variables. The computational procedure selects that variable first which is most closely correlated, then the second is chosen such that the two together are the most closely multiply-correlated with the dependent variable, and so forth.

Exhaustive examination of all the possible functional relationships among data collected for The Cost of College study is beyond the scope of this study. Indeed, this study, concentrating resources as it has on the collecting and validation of data, leaves little room for analysis. The investigations described here are extremely limited and serve only to indicate possible directions for further study.

B. Results

1. Cost of Instruction per Student (CIPS)

In order to focus this limited analysis, we have concentrated our attention on the single variable of most interest in any analysis of the cost of college, viz., the instruction cost per student year. The CIPS is, of course, the principal element in any model which is set up to project total costs of college.

Three sets of relationships, involving nine variables, were developed. The objective was to narrow our focus to those variables which seem to move in a functional relationship to instruction costs per student.

The dependent variable, per year student instruction cost, is obtained by dividing instruction outlays (see Part I) by enrollment. There are obviously a great many alternative formulations which could be evaluated. Any of the other nine expenditures items could have been included, for example. But since a detailed step-by-step analysis is beyond the scope of this study, we chose to concentrate on only this variable.

CIPS was regressed on three sets of variables. The results of these computations are given in Table III-1, below. Although the introduction of successive independent variables does not result in any startling shifts, each step is presented for the sake of comparison.

The first set of relationships gives the best "fit". More importantly, it summarizes in one equation the impacts of those variables which are most closely correlated with the instruction costs of college.

As Table III-1 makes clear the cost of instruction seems to be most closely associated in average SAT scores of colleges' entering freshmen. This cost seems to increase one or two dollars for every point increase in the SAT average.

We might, of course, expect SAT's to correlate well with costs in the absence of any adjustment for public vs. private control; the latter tend generally to cost more and to attract the better - qualified enrollees. The first two equation sets, however, include a dummy variable which corrects for the public-private distinction. The conclusion is that SAT can stand alone as an important cost indicator. Type of control is the next variable of interest, here using a public-private dichotomy to assign a dummy value. Again referring to equation sets one and two the computed coefficients suggest that the cost of instruction is approximately $300-400 higher in public schools, a conclusion which is

First Equation Set:

$$C = -100 + \underset{**}{1.74}X_1 \qquad R^2 = .330$$

$$C = -488 + \underset{**}{2.37}X_1 + \underset{**}{212}X_2 \qquad R^2 = .443$$

$$C = -493 + \underset{**}{1.49}X_1 + \underset{**}{498}X_2 + \underset{**}{0.33}X_3 \qquad R^2 = .654$$

$$C = 272 + \underset{**}{1.34}X_1 + \underset{**}{478}X_2 + \underset{**}{0.31}X_3 - \underset{**}{93.1}X_4 \qquad R^2 = .712$$

$$C = 292 + \underset{**}{.94}X_1 + \underset{**}{368}X_2 + \underset{**}{0.26}X_3 - \underset{**}{131.8}X_4 + \underset{**}{.06}X_5 \qquad R^2 = .768$$

$$C = 154 + \underset{**}{1.00}X_1 + \underset{**}{419}X_2 + \underset{**}{0.29}X_3 - \underset{**}{123.1}X_4 + \underset{**}{.05}X_5 + 46.6X_6 \qquad R^2 = .771$$

Second Equation Set

$$C = -101 + \underset{**}{1.74}X_1 \qquad R^2 = .330$$

$$C = -488 + \underset{**}{2.37}X_1 + \underset{**}{212}X_2 \qquad R^2 = .443$$

$$C = -490 + \underset{**}{1.74}X_1 + \underset{**}{419}X_2 + \underset{**}{0.27}X_7 \qquad R^2 = .599$$

$$C = 266 + \underset{**}{1.60}X_1 + \underset{**}{398}X_2 + \underset{**}{0.25}X_7 - \underset{**}{91.9}X_4 \qquad R^2 = .653$$

$$C = 286 + \underset{**}{1.05}X_1 + \underset{**}{291}X_2 + \underset{**}{0.22}X_7 - \underset{**}{137.6}X_4 + \underset{**}{.07}X_5 \qquad R^2 = .737$$

$$C = 206 + \underset{**}{1.08}X_1 + \underset{**}{318}X_2 + \underset{**}{0.23}X_7 - \underset{**}{132.8}X_4 + \underset{**}{.07}X_5 + \underset{**}{26.5}X_6 \qquad R^2 = .738$$

Third Equation Set:

$$C = -604 + \underset{**}{2.71}X_1 \qquad R^2 = .635$$

$$C = -216 + \underset{**}{2.19}X_1 - \underset{**}{2858}X_8 \qquad R^2 = .714$$

$$C = -54 + \underset{**}{2.03}X_1 - \underset{**}{2853}X_8 - 3.75X_9 \qquad R^2 = .722$$

Table III - 1 (Continues)

	Average value in equation set:		
	1	2	3
Where C = CIPS	775	775	785
X_1 = Average SAT's of entering freshmen	504	504	513
X_2 = Type of control: Public = 0 Private = 1	--	--	X
X_3 = Tuition and fees per student	1097	X	X
X_4 = Enrollment (ln)	7.20	7.20	X
X_5 = Average faculty salary	9919	9919	X
X_6 = Religious control: Religious = 1 Nonreligious = 0	--	--	X
X_7 = Tuition and fees less student aid	X	927	X
X_8 = Federal student aid/total expenditures	X	X	.043
X_9 = Average class size	X	X	21.8

Table III - 1 Cost per Student Regressions.

* indicates coefficients with t-statistic which is significant at the .05 level of confidence. ** indicates significance at the .01 level. Each school-year combination is treated as an independent observation. Relaxing of this assumption (thereby reducing degrees of freedom by two-thirds) does not affect significance results as shown in the table. Source for these and other regression results is the computer printout Stepwise Regression Analysis, CRA.

supported by results noted in Chapter II showing that public schools allocate a high proportion of their budgets to instruction.

The next variable relates tuition income to instruction costs and suggests that about 30¢ of each additional dollar of tuition income goes for instruction. The corresponding variable is modified slightly in equation set 2 to reflect "net" tuition, i.e., tuition less student aid.

The fourth variable, enrollment, tests the widely accepted assumption that higher enrollments result in lower per student costs. This assumption is supported by both equation sets. The computed coefficients suggest that instruction costs decrease $12 per student for each 10% increase in overall enrollment. The logarithmic transformation of enrollments reflects our intuitive feeling that "diminishing returns to scale" will be encountered as enrollments grow; i.e., that in growing from enrollments of 1,000 to 2,000 we realize greater savings per student than in growing from 9,000 to 10,000. This result apparently supports the conclusion made elsewhere, that increasing size implies increasing efficiency [3, pp. 67-68]. We do not, of course, know whether the logarithmic form is the best or even better than, say, a linear form.

Average faculty salary does not appear to be closely associated with costs per student. Both equation sets suggest that a $1000 increase in average faculty salaries will increase instruction costs about $60, a relationship which would indicate a student faculty ratio of 17:1.

Finally, religious affiliation seems to have little relationship to costs. It appears reasonable to assume that most effects which might be associated with religious affiliation are already subsumed in the public-private variable; i.e., religious-controlled schools are not unlike other private schools.

Before going on to a discussion of the third equation set it would be well to comment further on these results. The relatively minor change in the tuition variable generated relatively little change in coefficients except for that associated with the "public" variable. The two are, obviously, correlated and tuitions might better be omitted in future work.

Second, although SAT's seem to be a good cost indicator, we note that the addition of other variables rather consistently diminishes their relative importance. It may well be that SAT scores are effectively proxies for other unexamined variables. We suggest that further analysis is appropriate, but meanwhile hold to the view that SAT's have proved out sufficiently to justify their use in policy planning.

The third equation set supports the other two in terms of the importance of SAT's as a cost-associated variable. The introduction of a "federal assistance" variable is intended to explore directly the cost impacts of federal assistance. The hypothesis is that the availability of federal assistance will tend to increase outlays on instruction. The hypothesis is not supported; in fact, the opposite appears to be true. The coefficient suggests that a one percent increase in the proportion of total expenditures derived from federal sources results in a $28.50 decrease in instruction costs per student. Such a finding is consistent with the hypothesis that Federal assistance programs (presumably by providing the academically less qualified with education opportunities) are generating demands on the colleges which are forcing them to divert resources away from their principal mission. There is obviously a great deal more research required before this hypothesis can be fully supported, however.

Finally, class size appears not to be an important cost determinant. Not only is it not significant statistically (although the sign is in accordance with expectations) but the total impact on costs over any plausible range of values which average class size might assume is small.

A fourth set of relationships has been examined to separate effects of type of control and year, especially as we might suppose there to be interactions among the two. The approach essentially distributes variation in per student instruction costs among a set of nine dummy variables representing type of control-year combinations. The independent variables are dummy variables. The per student cost c_{ij} in the i^{th} year and the j^{th} type of control is associated with an independent explanatory variable v_{ij} such that $v_{ij} = 1$ where the subscripts match those of the c_{ij}'s and $v_{ij} = 0$ for nonmatching subscripts. In this crude form no significant relationships emerge ($R^2 = .238$). The computed values are, however, used to show cost trends by type of control in Part 1.

2. Cost by class level.

Most cost models assume that upper division and graduate enrollments will generate more costs than lower division enrollments. This hypothesis can be tested by examining the model

$$C_T = a_0 + a_1FR + a_2SO + a_3JR + a_4SR + a_5GR$$

where C_T = total expenditures
FR = freshmen enrollments
SO = sophomore enrollments
JR = junior enrollments
SR = senior enrollments, and
GR = graduate enrollments

The coefficients produced are somewhat implausible and further work is recommended.

3. Administrative costs per student

While the analysis of Section 1 concentrated on instruction cost per student, most models also incorporate parameters for projecting costs of administration separately. In our opinion the principal independent variable for computing administrative cost parameters should be instruction cost. However, other relationships can be explored directly, viz., public vs. private, enrollment (ln), total expenditures, and religious vs. non-religious.

The computed equation incorporating these parameters is:

$$C_A = 2952 - 187X_1 - 375X_2 + 0.077X_3 - 113X_4$$

where C_A = administrative costs per student
X_1 = public/private dummy variable
X_2 = enrollment (ln)
X_3 = total outlays, and
X_4 = a religious/non-religious dummy variable,

in order of their insertion in the estimating equation.

The public schools evidently spend \$187 less per student for administration than do the private schools, a result which is in accord with the earlier finding that they spend substantially more on instruction. The "economies of scale" hypothesis, reflected in the enrollment parameter, is more strongly supported in the case of administrative costs than for instructional costs. The computed parameter indicates that each 10% increase in enrollments will be accompanied by a \$35 decrease in per student costs of administration.

The third computed parameter shows that an increase in total outlays of, say, \$1 million produces an increase in per student costs of administration of \$77. Total outlays includes expenditures for every purpose so that higher total outlays per student will reflect expenditures in non-instructional areas, e.g., student aid, public service, research, etc. The cost of administering these programs will show up in the form of higher costs of administration per student.

Finally, religious schools' costs of administration per student are about \$113 less than those of the non-religious, possibly reflecting the value of contributed services and lower salaries in the administrative areas.

4. Summary

The most persistent factor to emerge from this analysis is that the better qualified the students, the more costly their education. Such seem to have been the priorities established by higher education; whether this set of priorities is appropriate or not is another question.

To summarize the coefficients, other things being equal:

--a $1 increase in the cost of instruction per student (CIPS) seems to accompany a one point increase in average SAT's;
--public colleges' CIPS is $300-400 greater than that of private schools';
--there are significant returns to scale, amounting to a decrease of $12 in CIPS for each 10% increase in total enrollment;
--for each dollar increase in tuition, 25-30¢ goes into CIPS;
--religious schools' costs are not significantly different from other private schools';
--there are significant returns to scale in administrative costs; a decrease of $35 accompanies a 10% enrollment increase;
--costs of administration per student increase $77 for each $1 million of increased outlays.

C. Policy Considerations

An issue often raised in reference to policy questions concerning financial assistance to institutions of higher education is that of the efficiency of schools in handling their financial affairs. It is often argued that poor fiscal management or inefficient administration is a primary cause of high costs. Part I has shown, however, that some schools, by the very nature of their instruction and the clientele they serve, are "high" cost. The problem facing policy planners is that while it is undesirable to support costs which are the result of poor management, a school which is higher cost due to its particular characteristics may be deserving of federal aid, because its management is good and its costs are lower than at other comparable institutions. Some schools with lower costs, on the other hand, may actually suffer more from less efficient management than schools with costs twice as high.

Several studies, and unfortunately too many aid schemes, rely on an overly-simplified measure of costs which does not resolve this issue. The mean cost for a group of schools is computed, and then schools with costs falling above the mean are considered "high" cost and those below the mean, "low" cost. Quite clearly this division does not reflect any clear measure of efficient management, and as a policy guideline, is very deceptive.

Two key measures of cost considered in this study are instruction expenditures and administrative expenditures. By taking into consideration the various cost-generating factors at schools, regression analysis permits the policy planner to determine more precisely whether costs at a given school are high or not. When the regression calculations are used to estimate costs based on the given characteristics of a school's operation, a simple comparison between the estimated cost and the actual cost shows whether a school is more expensive than other schools with similar characteristics. Tables III - 2 and III - 3 summarize the comparisons made to determine high cost schools using the regression sets considered in the previous section, and those determined by the mean-high-low comparison. Comparisons 1, 2 and 3 present a graphic illustration of the differences between estimated and actual costs.

The regression sets did not include an exhaustive list of cost-generating factors and as a result, several schools exhibit wider variation between their estimated and actual costs than probably should be the case. The direction of the difference indicated, however, would not probably be changed.

Table 2

Summary of Cost Comparisons

Administrative Costs Per Student

High Cost Institutions (X)

Schools Sampled	Mean-High-Low Comparison	Regression*
2		
5		X
6		
8		
9		X
10		X
11		
14	X	
22		
25		
26	X	
28		
29	X	
30	X	
32	X	X
33		
34	X	X
39	X	X
40	X	X
42	X	
44		X
45	X	X
46	X	
48		X
55	X	X

*Cost factors considered: Public-Private, Enrollment, and Total Expenditure.

Table 3

Summary of Cost Comparisons
Instruction Cost Per Student
High Cost Institutions (X)

("Ø" indicates school was excluded from regression set)

Schools Sampled	Mean-High-Low Comparison	First* Regression Set	Second** Regression Set	Third*** Regression Set
2	X	X	X	Ø
5				
6	X			X
8	X	X	X	X
11				X
14	X	X	X	X
22	X	X	X	X
25				
26				Ø
28	X			
29	X	Ø	Ø	
30	X	X	X	
32	X	X	X	
33		X	X	X
34	X			
39		X	X	X
40		X	X	
42		X		
44		X	X	
45				X
46			Ø	X
48		X	X	
55	X	X	X	X

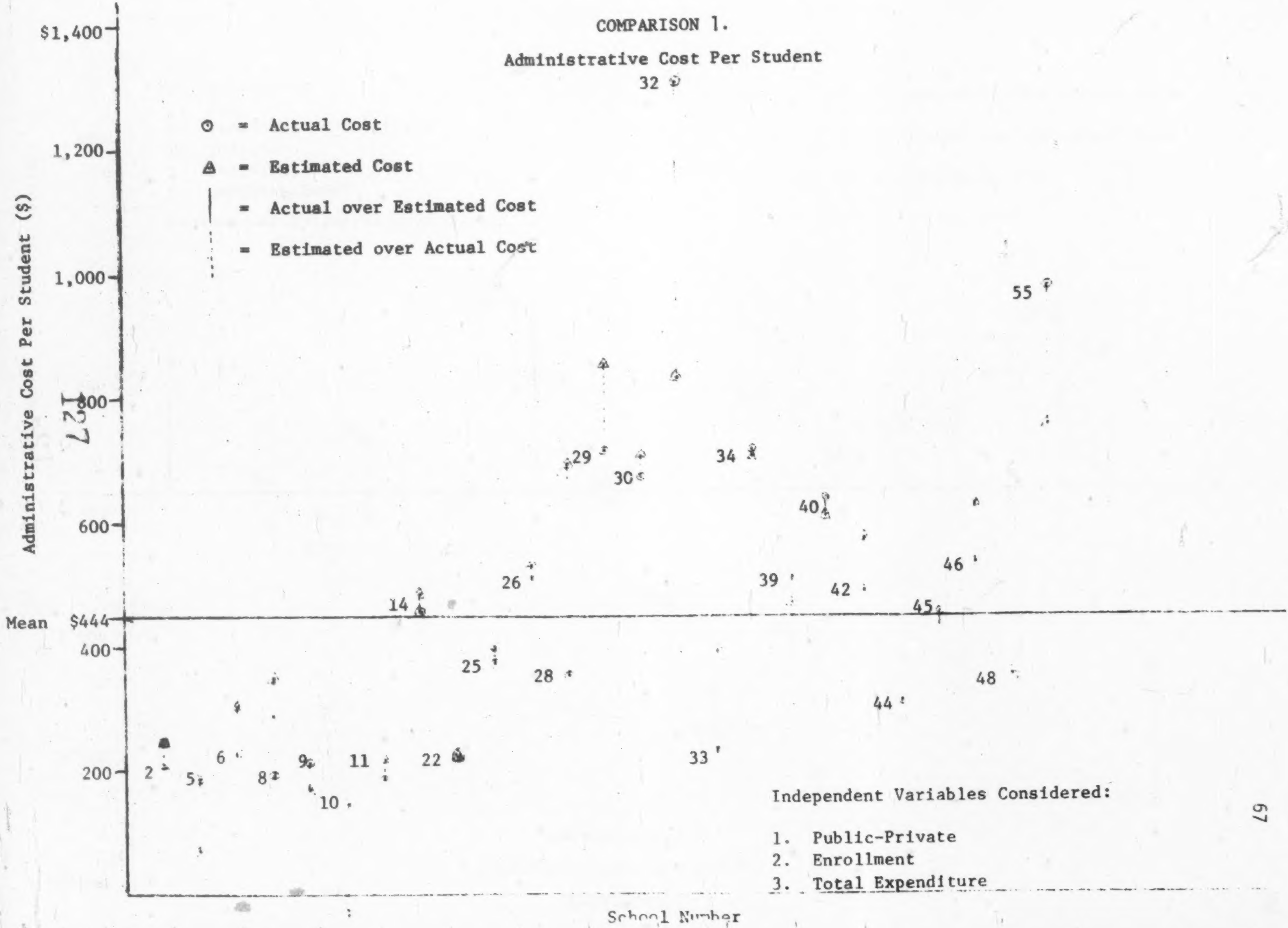
*Cost factors considered: Public-Private, Religious, Tuition, Average Faculty Salary, SAT, Enrollment.

**Cost factors considered: Public-Private, Religious, "Net" Tuition, Average Faculty Salary, SAT, Enrollment.

***Cost factors considered: SAT, Federal Aid, Average Class Size.

COMPARISON 1.

Administrative Cost Per Student



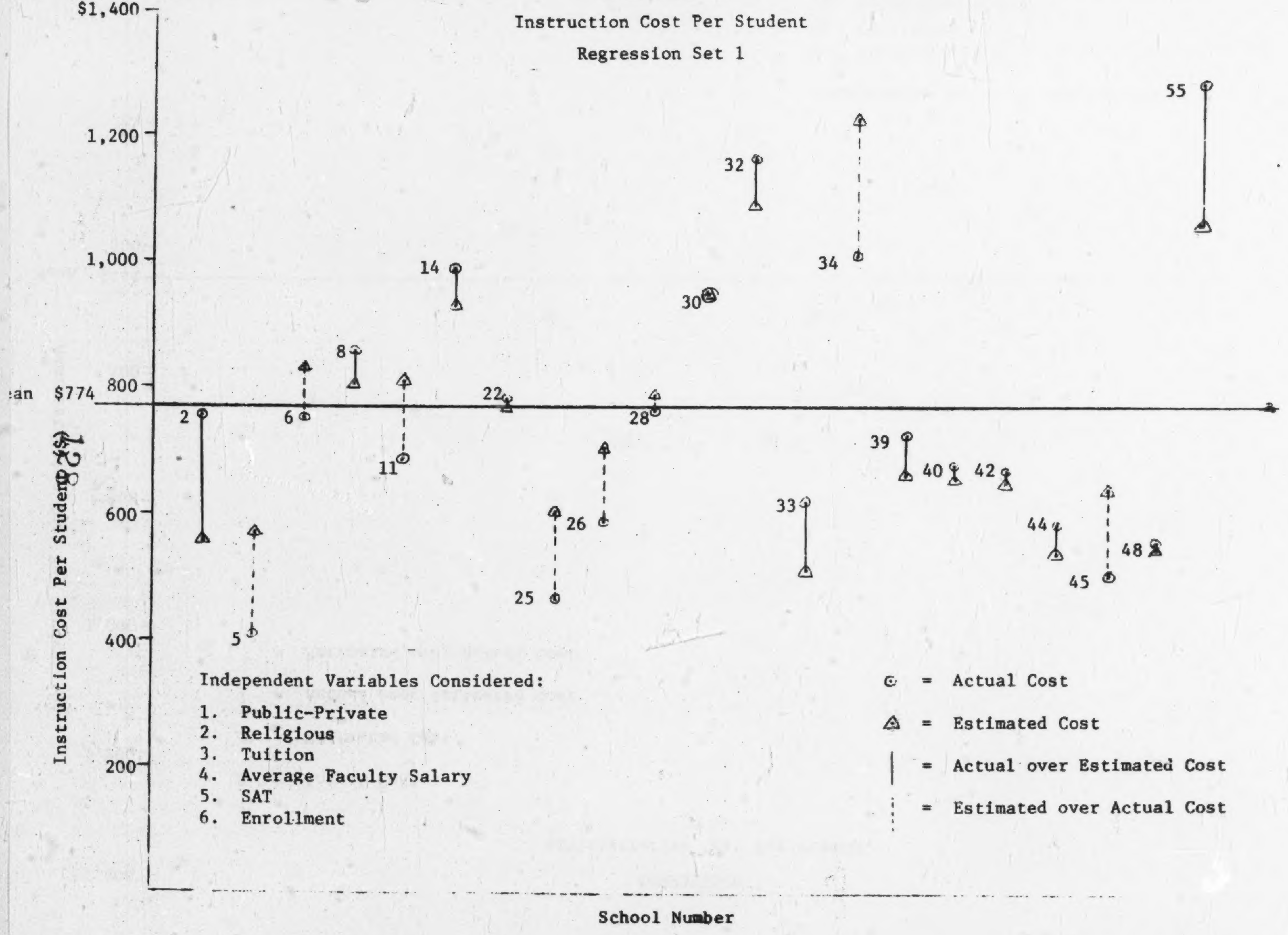
Independent Variables Considered:

1. Public-Private
2. Enrollment
3. Total Expenditure

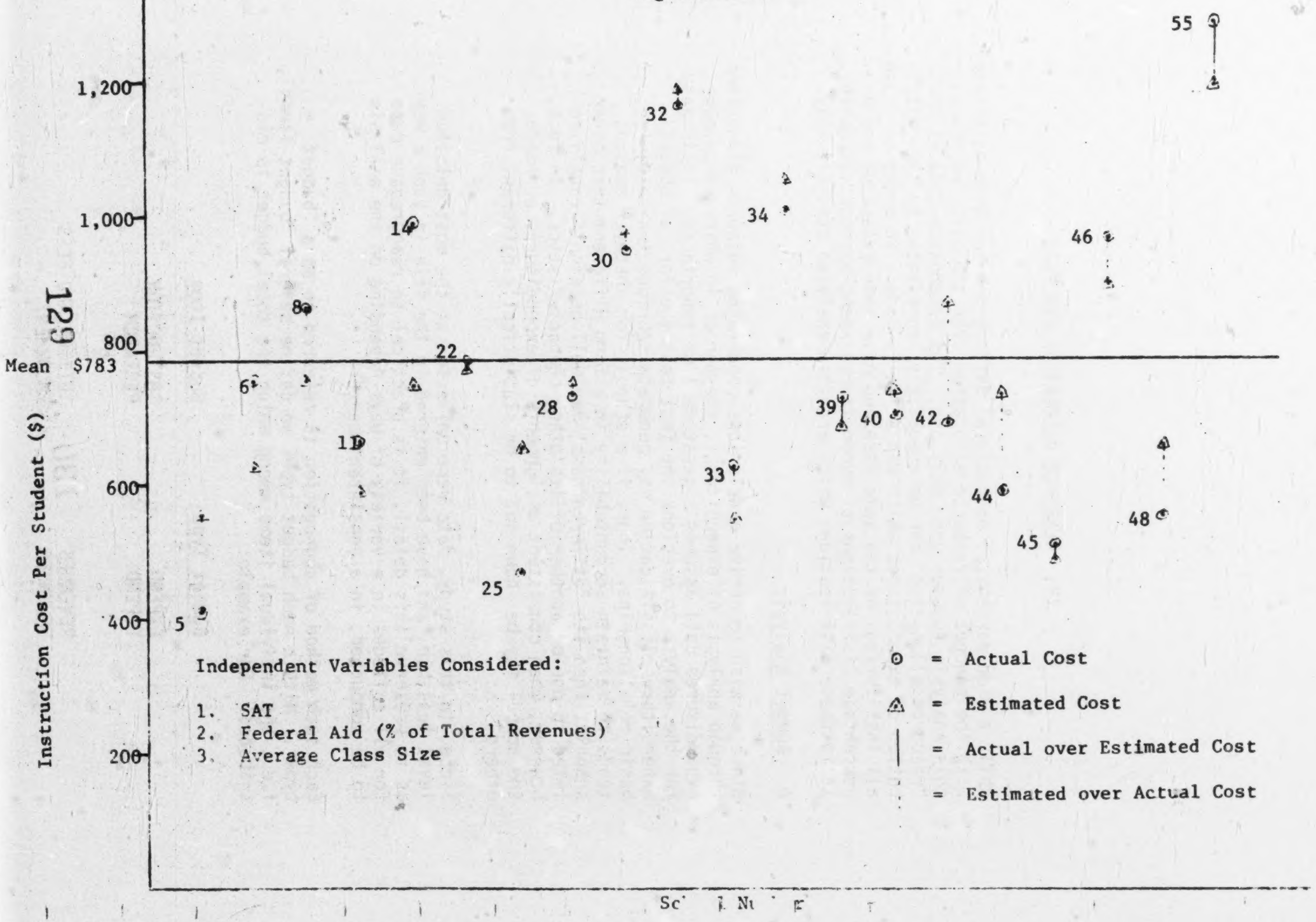
COMPARISON 2.

Instruction Cost Per Student

Regression Set 1



COMPARISON 3.
Instruction Cost Per Student
Regression Set 3



Independent Variables Considered:

1. SAT
2. Federal Aid (% of Total Revenues)
3. Average Class Size

IV. RESOURCE ALLOCATION ANALYSIS

While a wide variety of operational definitions has been associated with the concept of resource allocation over the past few years, this analysis focuses upon only one. The assumption here is that "resource allocation" can be adequately represented by the distribution of expenditures which was actually made. In order to place all institutions on the same base, we have made extensive use of percentage distributions of expenditures among various categories. It is these distributions which are then analyzed statistically.

A. Budget Analysis

Since we wish to derive conclusions concerning resource allocation through analysis of expenditures, the manner in which we develop expenditures data assumes a great deal of importance. It is easy for the analyst to overlook the fact that the form of budget/expenditure classification may generate spurious indicators of basic relationships. Thus, if a school, for whatever reason, tends to maintain accountability in a form different than other schools, then its "differentness" may well be significantly related to one or another of its other characteristics. In fact, however, when consistent assignments of expenditures are made, the school may be shown not to be statistically different from others.

Since, in this study, data were collected at the most detailed level feasible, and have been entered in the file in such a way as to preserve this detail, it is practical to reaggregate data for all colleges in a variety of ways depending on the analysis to be conducted, in a consistent manner.

Each such method of aggregation is referred to as a "budget type". Within each budget type, we define several "budget items", i.e., the individual items among which the total budget is distributed. For example:

Budget Type	Budget Item
EXPEND	INSTRUCTION
EXPEND	RESEARCH
-	-
-	-
REVENUES	TUITION AND FEES
REVENUES	ENDOWMENT
-	-
-	-

In order to obtain the desired classification of detailed expenditures for each budget type, a list is provided to the computer which relates detailed budget codes used in codifying data from the colleges to appropriate items in the variously-defined budget types. For example, the detailed code, 0204XXXX (Instructional Salaries, Department Administration), may be considered as an "Administration" expense for some analysis.

Consider the following table:

Budget Code	Type of Budget	
	EXPEND	REVENUES
0204XXXX	INSTRUCT	--
072101XX	LIB & AV	--
03XXXX21	ADMIN	--
83XXXXXX	--	GIFTS

in which it is desired to categorize budget items for expenditures and revenues. Code 0204XXXX is thus assigned to budget item "INSTRUCT" of the "EXPEND" budget type and not assigned at all to "REVENUES" budget type, since it is evidently an expenditure item. 072101XX is assigned to budget item "LIB & AV" of budget type "EXPEND". Finally, any detailed items coded 83XXXXXX will be added into "GIFTS" in the "REVENUES".

Summarizing now in accordance with the assigned budget types and, within those, by budget item, produces for each college a table of revenues, expenditures, and their respective percentage distribution by item. (See Figure 1.) It is these data which are the subject of the variance analysis described below.

The expenditure categories* of Figure 1 are:

1. Instruction
2. Research
3. Library and Audio-Visual
4. Facilities O & M
5. Administration
6. Student Services
7. Student Aid
8. Public Service
9. Employee Benefits
10. Auxiliary Services

It is important to note again that these expenditure budgets include only current operating expenditures. This choice was made

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*Definitions are given in The Technical Appendix to Part I. The corresponding revenue distributions are not used in this analysis.

	BUDGET ITEM	$1,000 1967	$1,000 1968	$1,000 1969	PERCENT DISTRIBUTION 1967	PERCENT DISTRIBUTION 1968	PERCENT DISTRIBUTION 1969
BUDGET TYPE EXPEND	INSTRUCT	3524.3	3858.0	4204.9	30.6	31.3	31.0
	RESEARCH	151.3	203.2	194.0	1.3	1.6	1.4
	LIB & AV	509.9	552.8	579.4	4.4	4.5	4.3
	FACIL OP	977.8	891.3	942.3	8.5	7.2	6.9
	ADMIN	2924.1	3020.8	3415.9	25.4	24.5	25.2
	STU SERV	777.0	897.2	995.4	6.7	7.3	7.3
	STU AID	1037.1	1221.5	1329.1	9.0	9.9	9.8
	PUB SERV	625.2	676.0	860.4	5.4	5.5	6.3
	BENEFITS	0	0	0	0	0	0
	AUX SERV	1004.7	992.8	1041.2	8.7	8.1	7.7
	TOTAL	11531.4	12313.6	13562.5	100.0	99.9	99.9
BUDGET TYPE REVENUES	TUIT/FEE	4715.1	5358.1	6151.5	38.8	40.4	41.8
	ENDOWMNT	3122.0	3322.8	3639.8	25.7	25.0	24.7
	GIFTS	763.2	838.6	916.5	6.3	6.3	6.2
	STATE	0	0	0	0	0	0
	OTH GOVT	267.8	425.2	431.1	2.2	3.2	2.9
	RES REV	151.3	203.2	194.0	1.2	1.5	1.3
	ED SERV	431.4	343.6	393.2	3.6	2.6	2.7
	OTHER	276.7	382.3	462.6	2.3	2.9	3.1
	AUX SERV	2412.4	2398.8	2541.1	19.9	18.1	17.3
	TOTAL	12139.9	13272.4	14729.6	100.0	100.0	100.0

Figure 1. Sample School Budget

in order to avoid problems associated with wide variations among college accounting systems in their treatment of capital-related expenditures such as debt service, transfers to non-operating funds, and capital outlays for new facilities.

B. Analytical Approach

The right-hand set of figures for Figure 1 shows the school's expenditure distribution (i.e., resource allocation). The hypothesis is that colleges which share certain characteristics will tend to allocate their resources differently than those who do not share those characteristics. All budget categories must be examined simultaneously for colleges with differing characteristics since two institutions may allocate equal percentages of their budgets to, say, instruction, while allocating significantly different percentages to libraries or student aid. Looking at instruction alone is not sufficient.

To develop the approach which we use to analyze budgets, consider the distributions of expenditures for two colleges shown in Figure 2. The first question of interest is whether the two are statistically significantly different and, second, if so, the difference be shown to occur simultaneously with other characteristics of the colleges.*

The analysis requires that we construct from the revenue-expenditure data a statistic which corresponds to a theoretical statistical function which can then be used for tests of hypotheses. To do this, suppose that the distribution of expenditures for college A is given by $x_1, x_2, \ldots, x_i, \ldots x_m$ where the i's represent the expenditure categories of Figure 1, and x_i is the percent of total expenditures allocated to the i^{th} category. Suppose further that the expected values of the x's are, respectively, $e_1, e_2, \ldots, e_i, \ldots, e_m$. Then the statistic

$$(1) \qquad \sum_{i}^{m} \frac{(x_i - e_i)^2}{e_i}$$

possesses a chi-squared distribution. Since we are concerned with the distribution of expenditures, the x_i's must necessarily add up to 1.0; the distribution of (1) thus has m - 1 degrees of freedom.

While this is true for college A, we wish to extend our analysis to all dolleges. Since the statistic in (1) can be constructed for each of n schools, and since chi-square distributions are

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* Note that we avoid any implication of attribution. Thus we do not suggest that such-and-such distribution is "caused by" or is "related to" any characteristics.

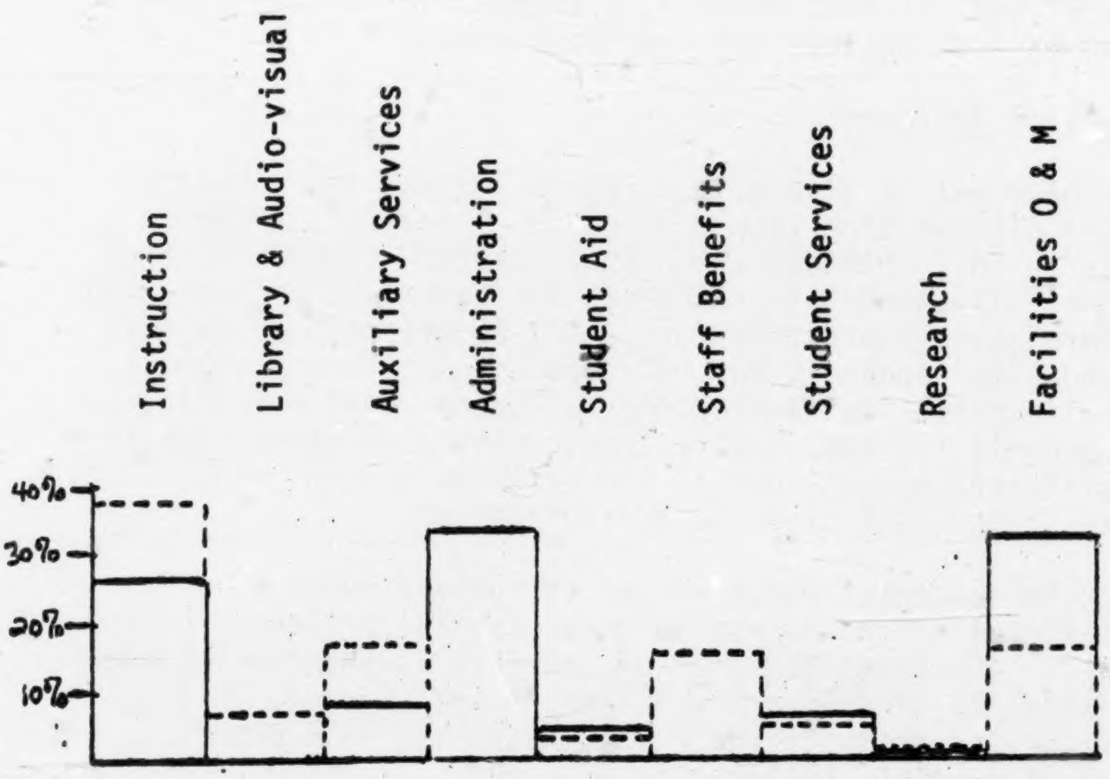

Figure 2. Sample Expenditure Distributions

Solid Line - College A
Dashed Line - College B

additive*, then

$$(2) \quad \sum_{j}^{n} \sum_{i}^{m} \frac{(x_{ij} - e_i)^2}{e_i},$$

where x_{ij} is the proportion of its total budget expended on the i category by the j^{th} college, also has a chi-square distribution with $n(m - 1)$ degrees of freedom. Since we do not know the population values of the e's, we may substitute the means of the x_i's to obtain

$$(3) \quad \sum_{j}^{n} \sum_{i}^{m} \frac{(x_{ij} - \bar{x}_i)^2}{\bar{x}_i}$$

which is distributed chi-squared with $(n - 1)(m - 1)$ degrees of freedom.**

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*If chi-square$_1$ and chi-square$_2$ possess independent chi-square distributions with v_1 and v_2 degrees of freedom respectively, then chi-square$_1$ + chi-square$_2$ will possess a chi-square distribution with $v_1 + v_2$ degrees of freedom. [1, p.216]

This statistic is of limited interest. However, suppose we separate our sample into two or more groups according to some criterion (for example, those for which aid accounts for more than 5% of all revenues vs. all others) and calculate (3) for each group separately. We might hypothesize that colleges grouped in like characteristics would tend to allocate their resources in roughly the same way, i.e., that the quantities denoted $(x_{ij} - \bar{x}_i)^2$ would tend to be significantly reduced by such grouping.

It is obvious that the statistic in (3) can be computed for each such group, and that it possesses the characteristics noted. What we wish to ask is whether the statistic (3) is significantly reduced by grouping, i.e., we wish to test whether the chi-squared statistics computed for groups is significantly different than that computed over all observations taken together. It turns out that each of the resulting estimates of chi-square can be compared with the value of chi-square computed over the whole sample by means of an F-test, a test of the equality of chi-square statistics.***

Briefly, if the ratio formed by performing the operations noted in the footnote differs significantly from one, then the hypothesis that institutions in the separate groups being tested make significantly different resource allocations is sustained. Table 1 gives the computational tableau for testing two factors and their cross-classifications.

The two-way classification is introduced in order to make our test more sensitive to variations among schools. That is, the pattern of resource allocation should become more homogeneous as we subdivide our sample further. For example, schools with high average SAT scores would tend (by hypothesis) to distribute their expenditures in approximately the same way. And schools with high average scores and, for example, low dependence on tuition revenues, would tend (again by hypothesis) to be even more homogeneous in their expenditure patterns.

**Chi-square is applicable when its distribution depends on unknown parameters (means in this case) provided that the unknown parameter is replaced by its maximum likelihood estimate and one degree of freedom is deducted for the parameter thus estimated. [1, p.170] The variables x_1 must be normally distributed, an assumption we will accept without testing although such tests are available.

*** $F = \frac{U_1/v_1}{U_2/v_2}$ has an F-distribution with v_1 and v_2 degrees of freedom if U_1 and U_2 possess chi-square distributions with v_1 and v_2 degress of freedom, respectively.

Classification	Chi-squared	Degrees of freedom	Mean Square
(1) Factor 1	$S_1 = \sum_{k}^{r} \sum_{j}^{n_k} \sum_{i}^{m} \frac{(x_{ijk}-\bar{x}_{ik})^2}{\bar{x}_{ik}}$	$df_1 = (m-1)(n-r)$	S_1/df_1
(2) Factor 2	$S_2 = \sum_{h}^{s} \sum_{j}^{n_h} \sum_{i}^{m} \frac{(x_{ijh}-\bar{x}_{ih})^2}{\bar{x}_{ih}}$	$df_2 = (m-1)(n-s)$	S_2/df_2
(3) Cross-classified	$S_3 = \sum_{h}^{s} \sum_{k}^{r} \sum_{j}^{n_{hk}} \sum_{i}^{m} \frac{(x_{ijkh}-\bar{x}_{ikh})^2}{\bar{x}_{ikh}}$	$df_3 = (m-1)(n-rs)$	S_3/df_3
(4) Total	$S_4 = \sum_{j}^{n} \sum_{i}^{m} \frac{(x_{ij}-\bar{x}_{i})^2}{\bar{x}_{i}}$	$df_4 = (m-1)(n-1)$	S_4/df_4

Where n = number of colleges
n_k = number of colleges in k^{th} category of Factor 1
n_h = " " " " h^{th} " " Factor 2
n_{hk} = " " " ", jointly, the k^{th} category of Factor 1 and h^{th} category of Factor 2.
r = number of categories used for Factor 1; $1,\ldots,k,\ldots,r$
s = " " " " " Factor 2; $1,\ldots,h,\ldots,s$
and remaining variables are as described in text.

Table 1. F-Test Tableau

It is hypotheses of these types which the statistics described above permit us to test. From Table 1 we form the quotients of the mean-squares, with "Total" mean square as the numerator. Significant departures from 1.0 indicate that the corresponding factor(s) do appear concurrently with "within group" homogeneity and "among group" heterogeneity of resource allocation.

The preceding discussion has centered around the analysis of expenditures, i.e., of resource allocations. It is evident that an analogous procedure could be applied to sources of revenue. The difference between the state-supported and private schools obviously would be the largest single effect. However, after setting type of control as one factor, other factors can be examined one at a time.

One other possible line of inquiry suggests itself. Suppose we wish to examine the more dynamic aspects of resource allocation. Specifically, we might wish to examine the increase in total expenditures from year-to-year in order to determine whether the incremental amount is distributed among all expenditure categories in the same manner as past expenditures or, indeed, among other schools. In any case, the approach is similar. The examination of both these latter facets is beyond the scope of the present investigation.

With this note we can proceed to reformulate the basic hypothesis which we wish to test. First, what are the impacts of Federal student aid programs on institutions' resource allocations? This question is reformulated to the somewhat simpler: do the Federal programs have any impact on resource allocation? That is, suppose we classify institutions according to some index of dependence on Federal program aid. Can we show that they make differing resource allocations? The following section answers this question.

C. Results

For most of the selected cross classifications 27 colleges' data were available, or 81 college-year observations in all. It is a matter of some importance whether we regard the three years' observations for each school as independent or not. The "strong" assumption is that years are independent, the "weak" assumption is that they are not. The effect of making the weak assumption is that degrees of freedom are reduced by approximately two thirds, with the result that computed F-ratios are rarely statistically significant. The selected cross-classifications are given in Table 2 and computations in Table 3.

The key variable used in analysis is total federal student aid as a proportion of tuition and fees. The assumption is that to the extent federal programs make up an increasing proportion of all revenues received from students, institutions' allocations of resources will tend to vary. This assumption is analyzed in a variety of circumstances in tests 1-5. Tests 6-11 examine in a number of other relationships which might be thought to influence resource allocations.

	Classifications			
1.	Federal student aid/tuition and fees:	1 = .15 2 = .05 - .15 3 = .05	Enrollment growth: (1969 enroll/ 1967 enroll)	1 = <.97 2 = .97 - 1.01 3 = 1.01
2.	Federal aid...:	[above]	SAT:	[above]
3.	Federal aid...:	[above]	Socioeconomic status:	1 = 1 2 = 2 - 3 3 = 4
4.	Federal aid...:	[above]	Year	[above]
5.	Federal student aid/ expenditures:	1 = >.04 2 = ≤.04	Control	[above]
6.	Control:	[above]	Student Aid/ Recipient:	1 = ≥$500 2 = $500
7.	Control	[above]	Aid per enrollee (average)	1 = >100 2 = 100
8.	Control:	1 = State 2 = Independent 3 = Religious	Year:	1 = 1967 2 = 1968-69 3 = 1969-70
9.	Control:	1 = State 2 = Independent 3 = Religious	Selectivity: (Barron's rating)	1 = 1 - 6 2 = 7 3 = 8 - 9
10.	SAT:	1 = 510 2 = 510 - 475 3 = 475	Average faculty Salary:	1 = 11K 2 = 10 - 11K 3 = 10 - 9K 4 = 9K
11.	SAT:	[above]	Teaching loads:	1 = 360 hrs/year 2 = 360 - 300 hrs/year 3 = 300 hrs/year

Table 2. Resource Allocation Analysis: Selected Cross-Classifications

	Tests	Degrees of freedom (see below)	F.05	Class 1	F-Values Class 2	Cross-class
1.	Fed aid/Tuition & fees: Enrollment growth	603	1.12	1.099	1.193	1.473*
2.	[Same]: Average SAT scores	513	1.15	1.091	1.155	1.297
3.	[Same]: Socioeconomic status	414	1.16	1.110	1.249	1.310
4.	[Same] Year	603	1.12	1.092	<1.0	1.040
5.	Fed aid/Total Outlays: Control	630	1.12	<1.0	1.118	1.175
6.	Control: Student aid/Recipient	630	1.12	1.118	1.033	1.145
7.	Control: Student aid/Enrollee	630	1.12	1.118	1.029	1.156
8.	Control: Year	648	1.12	1.089	< 1.0	1.070
9.	Control: Selectivity	648	1.12	1.089	1.078	1.264
10.	SAT scores: Average faculty salary	468	1.16	1.124	1.034	1.222
11.	SAT scores: Average teaching loads	452	1.16	1.143	1.123	1.329*

Table 3. F-Test Results. Smallest (i.e., cross-classified) denominator degrees of freedom only are given. All d.f.'s are based on "strong" assumptions of interyear independence of observations within colleges. * indicates significance under "weak" assumption. Source: Computer listings; Budget Distribution Analysis.

Table 2, Tests 1-4, show that the Federal aid variable alone cannot be associated with changes in the pattern of expenditures. When cross-classified with other factors, however, (with the exception of year) it is shown to affect allocations. Collectively, in fact, the first four tests show that varying dependence on federal assistance coupled with any of the variables noted, will be associated with significantly different resource deployment. In fact, a very strong association between federal aid, enrollment change, and resource allocations is shown by Test 1. This result suggests that federal aid is permitting colleges to grow, perhaps because federal assistance gives them more leeway in allocating their resources. The validation of such interpretations requires, of course, direct examination of institutions' budgets.

The low F-ratios associated with the "year" variable strongly support the views that expenditure distributions changed negligibly over the three-year period. This is not surprising, since there is little to suggest that the whole structure of expenditures is changing markedly over time.

Tests 5-9 show that control, alone, is not a strong indicator of allocation decisions. This supports our belief that type of control, although useful as an indicator of revenue distributions, is of little use in the analysis expenditure allocations. Cross-classification with three measures of student aid (viz. Federal aid as a proportion of total outlays, student aid per aid recipient, and student aid per enrollee) produces barely significant results.

The cross-classification of type of control with selectivity (as measured by Barron's Profiles of American Colleges) is the only strongly significant statistic associated with control and suggests that there may be strong homogeneity in expenditures patterns of schools which are similar in type of control and selectivity.

All three tests in which SAT scores enter are significant; SAT taken by itself is significant in all three cases, and it lends significance to variables with which it is cross-classified. When the significance of selectivity, which tends to correlate well with the SAT measure, is considered the evidence for simultaneity of shifts in SAT levels and changing structure of outlays becomes very strong indeed.

D. Summary

The question "Do Federal student aid programs have impacts on institutions' resource allocations?" is answered in the affirmative. We must add, however, that the impacts considered alone are fairly weak. It is only when we consider the interaction of these effects with others that the impacts become statistically measureable. The interactions, once effected, however, do produce statistical reactions at a fairly high level of confidence.

Finally, the impact of student qualifications, as measured by SAT scores, apparently is strongly related to the kinds of budgetary decisions it makes. This result reaffirms the strong association of SAT's with other college characteristics which was noted in Chapter III.

While certain general questions can be answered with the indicated degrees of statistical confidence, the reader should be warned that the interpretation of these results is by no means as simple as the interpretation of regression analysis results. Analysis of individual school budgets, or preparation of "average" budgets according to classification of the schools is required in order to convert these statistical results into policy recommendations.

PART II

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